Mexican and German Communal Forestry: An Accountability Framework for Comparing Governance

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Abstract

Both Germany and Mexico, distinct in location and culture, have a tradition of collectively–owned forests and recently broadened rights of local communities in forestry management. Within these contexts has come the recognition of the forests' potential in generating revenues – as a way to alleviate poverty and increase jobs in Mexico and to reduce financial deficits of forest companies and meet concerns of local citizens in Germany. Accordingly, community-level governance in both countries struggles with management models that incorporate civic concerns into making market and forestry management decisions over local forest lands. The German and Mexican cases represent varying levels of state, private and local control over forestry services, where Germany continues to have strong state involvement and Mexican communities remain heavily influenced by state policies.

The aim of this paper is to show that, although large differences exist between the two common property regimes, each side can learn from the other because of shared issues of management accountability and accessing expertise. Theories of the firm, namely agency theory and transaction cost economics, frame the analysis to explain how each country has dealt with monitoring and accountability issues pervasive in forest management. We conclude by suggesting arrangements to diminish further moral hazards – a key problem addressed by agency theory – in both countries; emphasizing control mechanisms and merging responsibilities among the actors.

Key words: *Germany, Mexico, common property forestry, agency theory, transaction costs, measurement costs, monitoring costs*

I. Introduction

Research on the commons is vastly interdisciplinary in scope which may be one reason why there have been a limited number of cross-country comparisons of common resource management models (IFRI 2008, Poteete/Ostrom, 2004). In this paper, we seek to demonstrate the inherent value in such comparisons. The commons has been increasingly recognized as representing a significant basis in the economy, livelihoods, governance regimes, and social relations (NRC, 2002). To use forests, the basic resource in our study, as an example, 377 million hectares in the top 24 forested countries are owned or reserved for community use, implying at least that much forest land is managed by a narrowly defined local stakeholder governance structure (White/Martin, 2002). The attention to participation of local stakeholders has also risen on the agenda of development agencies and NGOs as a means to promote equity, efficiency and alleviate poverty (World Bank 2007). These trends in research and policymaking highlight the value in developing comparisons of models to analyze the systematic challenges of communal management within larger

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social and ecological systems (Agrawal 2001). Such comparisons promote recognition and understanding of how commons institutions continue to evolve with changing political and economic environments.

To illustrate a cross-country comparison, we juxtapose the German and Mexican models of communal forest governance. While the respective local communities exist in considerably different settings, similarities in issues and problems are striking and instructive. Both countries have legislated common property into existence where legally defined communities own forest land. In Mexico, the term "community" refers to the *comunidades* and *ejidos* incorporated under Article 27 of the 1917 Constitution and which have been given title as a group to land re-appropriated from large landholders. Articles of incorporation include rules on membership, governance and land rights. In Germany, the term "community" refers to municipalities, that is, publically incorporated institutions in which member citizens elect a municipal council and mayor. Municipalities are villages, towns, community associations or "Kreise", the latter being public corporations that include larger regional areas. The most obvious difference between countries is scale. Mexico's National Forest Inventory estimates 56.8 million hectares of forest, with about 80% communal, 7% state, and the rest private, or 45 million hectares of communal forest. In Germany, forests cover about 11 million hectares. The breakdown is 47% private, 34% state, and 19% communal, which is more than 2 million hectares of municipal forest. Yet, both forms of forestry management have experienced or are experiencing shifting control over forest land from state to local control, and both are faced with the problem of institutionalizing or contracting technical forestry and market expertise. Shared issues which limit options, permute interests of the stakeholders or restrain performance center on management:

1) Access to knowledge of technical and business management skills for forestry: in both Germany and Mexico, local stakeholders are unspecialized in forestry and need to develop expertise in-house or hire in forestry professionals and managers.
2) Accountability of local actors and lack of transparent business operations. Although delegation to hired specialists is possible, both cultures face the need for managerial accountability, be it forest or business. In Germany, state managers have greater involvement in day-to-day decision management than in Mexico.
3) Little implementation or ability to implement transparency and control measures which open possibilities to carry out community-motivated management objectives.

These themes are oft-repeated in the common pool resource literature, frequently in terms of elite capture of local resources (Abraham and Platteau, Platteau and Gaspart 2003, Brett 2003) but much fewer systematic studies exist as to why such problems persist. To pull our comparison of resource management regimes into a framework of analysis, we focus on the problem of representation of stakeholder interests – primarily the owners of the common forest resource – and those they appoint or hire to manage forest conservation and production activities in communal forest land. We propose economic theories of the firm – a combination of principal-agency and transaction cost economics – as an appropriate lens for analysis. This approach is less comprehensive than the Institutional Analysis and Development (IAD) framework (Ostrom 2005) but allows us to examine accountability within

community and community-private sector exchanges which we suggest is a fundamental and shared problem in both country scenarios and may be generalizeable to other countries and resource situations. Despite the stated need for capacity-building and accountability for common property systems, there are few comparative examinations of the underlying problem. While private-sector productive organizations are acutely aware of the accountability issue and have adopted safeguards in their corporate and contractual designs, communal tenure regimes have not profited from this level of knowledge and expertise. Some are adapting but the slow pace indicates that remaining collective action problems and transaction costs could be substantial, especially where forestry is a relatively new role for local populations who have been historically limited in their control over local resources.

The principal-agency model has become a paradigm incorporated into various branches of economics such as contract theory, transaction cost economics and mechanism design which are in turn various aspects of organizational design applications. We are not the first to apply these concepts to forestry management. Wang and van Kooten (2001) and Globerman and Schwindt (1986) cover in great detail the transaction costs of forestry in Canada, for example. The political economy literature also uses agency theory to describe how politicians represent voters (Persson and Tabellini, 2000). In these cases, the voters are principals who elect a politician as their agent to coordinate and deliver local goods. In this paper, we maintain the agency concepts within the context of the firm, as many applications we propose refer to the organizational and contractual relationship between the public and the agents in charge of a productive enterprise which uses local common resources, in this case the forest.

This is not to say that municipalities and communities are to be equated to a firm. For example, policy makers and community members in Mexico state that local communities operate according to a presumably nonmarket-competitive “logic of the community” and the competitive “logic of the marketplace” (Chapela, Merino, Vidal). We present the main issue in our paper as a problem of performance measurement and accountability across complex production relationships where the politics and economics of trust in leadership are necessary to understand in assessing collective choices and outcomes as representations of the stakeholders involved. Forests are part of a livelihood strategy in Mexico, and in both countries, forests provide monetary and nonmonetary benefits for local stakeholders. Representative leadership for overseeing the resource remains an issue which we explore across a variety of interactions with agent theoretic tools.

The paper is outlined as follows. The next section presents the basic concepts of firm theory relevant to our analysis. Section three describes the institutional framework in Germany and Mexico where a review of the historical trends reveals a recent strengthening of local control in a legal and political sense but remaining weaknesses in capacity to harness local benefits in both cases. We identify decision makers (both formal and informal), the resource and institutional features of management and production that leave stakeholders at risk of moral hazard problems in acquiring services. The fourth section places the German and Mexican models into a principal agent framework (PA) to assess these risks and to show how communities in each country have responded to address the challenges. The last section concludes the paper.

II. Explaining organizations: Theories of the firm and agency behavior

Agency theory and transaction cost economics both make up a branch of economics called new institutional economics which examines the structure and performance of organizations.[3] The brief synopsis below describes the basic tools and analytical approach which we apply later.

Agency theory is concerned with behaviour of actors where the critical problem is information.[4] The inefficiency of asymmetric information on the part of a buyer and seller in an exchange are referred to as the moral hazard problem. Often the story is told with two parties, a "principal" and an "agent" An "agent" provides an input to a "principal" who then compensates the agent. The outcome is a function of uncertain information where the principal is the uninformed party and the agent is the informed party[5]. The agent exploits the information asymmetry to his/her own advantage which leads to less-than-efficient effort levels when the agent's and the principal's objectives are not the same. For example, is the observation of sloppy work caused by a worker shirking on the job or unforeseen equipment failure or weather conditions and would the worker explain truthfully if the boss asked? Thus, models based on principal-agency demonstrate informational inefficiencies which have real costs to both principal and agent. Transaction cost economics takes the idea of uncertainty further by stating that writing a complete contract is impossible because of the myriad combinations of contingencies that are unforeseeable and therefore hard to capture in any one contract. Instead, parties to an exchange operate within constraints, leaving them to act in a "boundedly rational" way. Transaction cost economics also seeks to minimize costs through an optimal configuration of ownership over assets.

Monitoring and control mechanisms aim to reduce moral hazard and hold agents accountable by reducing the noise associated with their observed output (Jensen and Meckling 1976). The design of contracts using these mechanisms attempts to reduce agency costs by eliciting information and aligning incentives to increase joint welfare. Among possible mechanisms are (Ruppert 2006):

- ***Internal control instruments for organization:*** Includes information and communication systems which create transparency*;* budgeting; behaviour rules; hearings (Jensen/Meckling 1976 P. 308 & 332) or other internal arrangement; advisory councils by members of the community who have knowledge in forestry; sanctions if agreements are not followed (e.g., dismissal, shortening the remuneration or "damage of the good reputation"); financial indicators such as monetary measures within an accounting system; nonfinancial performance measures which do not only rely on direct observation (monitoring) of the behaviour of the agent.
- ***External control instruments:*** (Independent) controller (e.g. certification company, planning company); court sanctions if agreements are not followed.
- ***Nonfinancial controlling instruments by agents:*** Signalling through provable qualifications; giving special securities; giving hostages and collaterals (like sale or return) or hands-tying like reputation.

[3] For readers further interested in the distinction between principal-agency and transaction cost economics, see, see Eisenhardt (1989) and Williamson (1988).
[4] For the basics of agency theory see Berle and Means (1932), Alchian and Demsetz (1972).
[5] See Salanie (1997) and Hart and Holmstrom (1987) for fuller exposition.

- ***Incentive systems:*** If controlling is not possible or too expensive, other incentives which have a similar effect on the agent as ownership itself are: "hard incentives" through market pressure; monetary incentive schemes; "soft incentives" such as values and organizational culture and trust.[6]

For purposes of our paper, we categorize uncertainty in two ways. First, all production activity has a degree of *outcome* uncertainty and is assumed to be present in all firms (Eisenhardt, 1989; pp. 64-65). Second, agent-based *behaviour* uncertainty arises where, the more complex and uncertain the production process, the greater scope for moral hazards, like poor but unmeasureable effort or quality levels.[7]

For example, in forestry, *outcome* uncertainty concerns the idiosyncrasies of market, environmental conditions, and constraints on where production can occur from year to year. *Behaviour* uncertainty arises due to the idiosyncrasies of the silvicultural system, the tree distribution and forest vertical structure which can increase the complexity and uncertainty of the production process.

Furthermore, how productive activities are organized can minimize moral hazard. Fama and Jensen (1983) (FJ) illustrates the implications of separating ownership and control between principals and agents. The paper continues to be applied today, especially in the business literature on corporate governance. FJ describes three main roles in a productive organization:

1. Risk bearing or residual claims: bears risk and enjoys residual profit streams
2. Decision management: generate proposals and implement decisions
3. Decision control: ratify and monitor decisions

Typically, owners are the residual risk bearers. They define goals and objectives of the production activity and hire managers and workers to reach these objectives. Managers who make day-to-day decisions in the operations are decision managers. Executive boards, advisory councils and voters are decision controllers. A chain of delegation of management activities from principals (risk-bearers) to agents (decision managers or controllers) can occur though the activities of the last agent in these principal-agent chains and should correspond to the objectives of the first principal.

How efficient is an organization at minimizing agency costs depends on the relationship of these actors given the trading environment. FJ's main hypotheses are:

1. Separation in an organization of risk-bearing (residual claims) and decision management leads to a separation of the decision management and control functions.
2. A combination of the decision management and control functions leads to residual claims also being restricted to these same persons.

[6] As an example of how principal-agency theory encompasses a wide range of contractual relationships, Ensminger 2000 used similar PA concepts to explain family adoption of helpers as a seemingly uncalculated expression of trust among cattle ranchers in Africa, showing the variety and creativity of ways to align incentives and create trust in different settings.

[7] For the importance of measurement see also Barzel (1982).

That is, combining all three roles tends to maximize benefits when the benefits of specialization are less than the benefits of controlling agency problems, which can be controlled usually in smaller, less complex operations. Where there are many residual claimants and valuable, specialized knowledge is important, separating the two decision roles improves outcomes to avoid the "fox watching the henhouse". In forestry, organizing forestry management and timber operations can take the forms of 1) market (e.g. private company) leading to a separation of roles, 2) hierarchy (e.g. municipally-owned company included in the public budget with municipal personnel, municipally-owned company excluded from the public budget, community-managed operations), leading to a greater combination of roles, and 3) cooperatives, leading to hybrid of separating and combining roles.

As certain characteristics become more pronounced in a potential exchange, transaction cost economics predicts that one side of the exchange will seek to provide those services "in-house", or as close to own-production as possible versus outsourcing. Types of in-house or integration of services include vertical integration (backward/upstream or forward/downstream), and lateral (Williamson 1985). Transaction costs refer to the costs of exchange beyond the production costs such as costs of negotiating, monitoring and enforcing contracts. These costs can be interpreted as direct transaction fees like legal and brokerage fees and costs of monitoring exercises, or interpreted to refer to the hidden costs of nonverifiable actions. The key factors whose presence and intensity tend to increase transaction costs are (Williamson 1985):

- ***Asset specificity****:* asset investments specific to a trading partner become embodied in the trade and have less value elsewhere.
- ***Uncertainty and complexity:*** As described above, production output can depend on conditions which are unforeseeable at the time of a contract. Its level of complexity may require continual adjustments over time and nonverifiable quality and effort levels.
- ***Frequency of trade****:* How often sellers and buyers exchange the good or service.

The degree to which each of these factors are present affects industry structure. For example, the trucking industry reduced the nonverifiability of truckers' performance with the introduction of on-board computer monitoring, so that transport companies now own more of their trucks used for hauling instead of hiring independent contractors (Baker and Hubbard, 2004). Duration of contract can also be interpreted as a form of industry structure (Joskow) with longer contracts acting as incentives for optimal investments. Finally, attitudes toward risk and uncertainty are important for explaining contract choice (Spremann 1987). For example, a risk adverse forest owner (principal) will seek to transfer outcome risk to an agent by leasing the forest (Ruppert 2006).

In sum, the organizational structure is chosen to minimize the costs of moral hazard *and* the costs of mechanisms to reduce it. In both PA and transaction cost theories, uncertainty gives rise to the measurement and monitoring problem and affects the organizational structure. Moral hazard is mitigated through the institutional environment for exchange and contractual safeguards. If either outcome or behavioural uncertainty is high, measurement problems increase if the agent is to be kept to a performance standard. High uncertainty speaks for in-house production or

relational contracts based on well-founded trust. Outcome uncertainty depends on production characteristics (e.g., from forestry, tree species, forest structure, area conditions, size), and stakeholder goals (e.g., many different but connected goals are more easily managed in-house), and thickness of the market (e.g., are there enough "reliable" companies to choose from).

The introduction of monitoring instruments in the community sector as well as the choice of organisational form determines the distribution of property rights, whereas the choice of company management alters the effect of this distribution and of incentive systems (property surrogates) based on the actors' varying utility functions. The changing of the organisation form and the integration of monitoring instruments can lead to a higher motivation of the actors through the assignment of more property rights to company management and the connected increase in authority and responsibility, aside from gains in flexibility. This necessitates, however, that the German municipalities and Mexican communities increasingly exercise their right to control. The introduction of private instruments can therefore also increase control (e.g. improving information and communication systems to enhance transparency of the community by standardised accounting practices).

III. Institutional, resource and governance characteristics

This section explains the system of communal tenure of forests in both countries, giving particular attention to the institutional setting pertinent to our theoretical framework. We cover the historical background that led to the emergence of the land tenure patterns, forest characteristics and production, mechanisms of representation and participation in the governance of forest resources and the management options for timber operations, the roles of state and private sector, cross community linkages.

A. Emergence of communal forest property

1. Mexico

The community culture of Mexico is mainly agrarian-based. The Mexican revolution of the early 1900's wrested control away from large landholders and broke up the *hacienda* system to repatriate or redistribute land to peasants. The constitution of 1917 and the subsequent Ley Agraria formalizes communal ownership and title to these lands and specifies a local governance structure and rules for membership. These agrarian nuclei are classified as *comunidades* or *ejidos*, depending on the particular history of land settlement. For the purposes of our paper, the difference is minimal, and we refer to both entities as agrarian communities.

Forestry has had a separate history. Forests are communal lands which were exploited by nonlocal private companies and government operations without much community control in the early 1900s. Despite their claim to land under agrarian law, Mexico's community sector has only recently had the ability to commercialize their forests on an industrial scale. Starting in the 1940's, the Mexican government concessioned communal forests to semi-public, semi-private (henceforth parastatal) forest companies and pulp manufacturers. Communities had little control other than outright refusal to sign contracts. Complaints developed concerning quality of harvesting practices, lack of local hiring, training or on-time payments, displacement

of costs onto communities and lack of information on management and environmental laws (Antinori, 2000).

An era of activism and labor strikes from the sixties to the eighties changed the paradigm. The concession system was abolished in the eighties due to major bureaucratic reforms and activism. The subsequent 1986 Forestry Law is a product of the “community forestry" movement. The last thirty years in Mexico have seen a shift from government control of timber production on community lands to recognition of community rights to manage and commercialize common property forest resources. As a result, a pattern of community vertical integration into the forest industry has emerged across Mexico.

The Agrarian Reform of 1992 (Ley Agraria 1992) leaves the role of forests somewhat vague, as compared to the impact on agricultural land. The reform ended further creation of agrarian communities and opened the door to private land titling within the agrarian communities. While these changes have generated much activity around settling boundary claims and some privatization of urban and agricultural lands, the reform’s impact on forest tenure is less. First, under the law, any land classified as forest cannot be parcelled or privatized and would revert to the state if the agrarian community decided to dissolve its communal status, thus discouraging formal privatization. Second, the law permits other forms of dividing flow of benefits from communal forest harvests which has opened up more possibilities for production organization.

2. Germany

Municipal forestry has a long tradition in Germany. In the middle ages, legal organizations called *Markgenossenschaften* were created as a special form of cooperative to regulate land use. Members were farmers or villages who used the forest collectively. Often the forest of the Markgenossenschaft was combined with the forest of the territorial lords. In the 17th and 18th centuries, there were many dirges at the bad condition of the forest. Rules of the territorial lords were not observed (Hasel 1985, p. 93) and there were many disputes among the villages. Consequently, forest of the Markgenossenschaftswald was divided into three types of property: (1) private forest, (2) a special form of community forest (*Realgemeindewald*) today legally applied as private forest, and (3) municipal forest. Inaccessible, far away and hillside forest was given to the municipalities (Hasel, 1985 p. 89). Urban municipal forest has also been created by bestowal and purchase from king or church.

During Absolutism in the 17th and 18th centuries, municipal rights in Germany were undermined. While Liberalism in the first half of the 19th century reinstated many rights, the forest was kept under control of the state, with state regulation often explained as necessary to maintain its sustainable use (Ruppert 2006). Some municipalities maintained their own forest managers but in most cases the forest had to be managed by state foresters. The forest revenue belonged nevertheless to the municipalities and forest income was very important for many German municipalities at that time. This lasted until the “Third Reich” took hold and municipalities in principle were weakened against the centralized state. After the Second World War, Western Germany emphasized the right of municipal self government. However, there was a strict law for municipality forests and especially in South Germany the

municipal forest had to be managed by the state forest service again, explained by the need to build up the forest through uniform management. Where the municipalities had the right to manage on their own, many municipalities inherited an inexpensive state service which they may have been reluctant to give up. Herewith municipal forest land was incorporated into one state organization. At the same time, other forms of income became more important as citizens placed more emphasis on nature especially water protection and recreation. In Eastern Germany, in 1949, the municipal forests changed to "Volkswald" under the communist regime. Under German Unification, municipalities were retributed their forests in 1991.

In the last 20 years, some German municipalities became discontented with state service and wanted back the rights to decide for their forest. The forest owner associations and the municipality associations supported this sentiment. The political pressure allowed them to achieve changes in law. Now, in every state, municipalities are allowed to manage their forest, through restrictions differ. In four states – Baden-Württemberg, Rhineland-Palatinate, Saxony and Thuringia it is still forbidden to assign a private company to manage municipal forest.

German forestry science began in the 19th century and spread globally. Graduates of German forestry colleges worked in Russia, Scandinavia, France, India and other British colonies and the Americas. They made "sustainable yield forestry" a key concept (Grober 1999). Miguel Angel de Quevedo brought the French system in particular to Mexico (as Gifford Pinchot did to the US) in the early 20th century, and, based on its principles, founded the Mexican state forestry bureaucracy that continues today. This historical link between Germany and Mexico yields further irony that both countries have integrated scientific forestry, through the mode of state involvement, into current efforts of greater communal control of forest management.

B. Forest characteristics and production

1. Mexico

Mexico is more climatically diverse than Germany, giving rise to a different mix of tree species. Mexico contains subtropical, alpine and desert climates. Climate and vegetation vary extremely due to great variation in the relief, different climates and the various types of soil and vegetation. Mexico has a much wider diversity of species, especially oak, where it has over 100 different species.

One of the largest contrasts is the extent of forest cover in each country and the population with access to communal forest land. Mexico is 5 ½ times as large as Germany. By the 2001 Census count, 30,305 ejidos and agrarian communities exist in Mexico. Recent estimates state about half or 15,859 have temperate or tropical forest land (*bosques o selvas*). These include conifer, oak and mountain forests. One National Forest Inventory figure places Mexico's total for temperate and tropical forests at 63.4 million hectares, where 36.8 million hectares or 58% are in the social, or community, sector, with an average of 2,365 forest hectares per community.

Forestry production provides local revenue along the three channels of direct salary for local workers, profit distribution to the general membership, and investment in public goods. Profit distribution to individuals can be a significant part of yearly income. In a recent study of forty-one communties in Mexico, individual yearly

income from forestry operations ranged from $3000-58,000 pesos per person (Antinori et al. 2008). The majority of the communities reported that 50% or more of the local households received income from forestry. Other sources of income include ranching, agriculture and jobs outside of the community, including remittances.

Permit data collected from the ten most forested states in Mexico show that the majority of communities with current forestry production sell stumpage[8], followed by roundwood[9], and those with sawmill or processing capacity (see Table 1). A percentage of communities have harvested in the past, say for reducing fire hazards and diseased trees, as well as for commercial purposes, but are currently not harvesting. Antinori 2000 and Antinori/Rausser 2008 show that the main factors explaining community vertical integration downstream are past experience with the parastatal system which led to activism in the communities, a previously existing stock of human capital skills in the trade, and size and quality of forest.

TABLE 1

2. Germany

Because Germany lies in the moderate climate of Central Europe, its flora is affected by deciduous and coniferous forests. Extreme weather conditions are comparatively rare. The middle temperature in the summer lies at 16.5° and winter at 0.9°.

Overall, forests cover 29.5%, or about 11.1 million hectares of Germany. In Germany, about 2 million hectares belong to municipalities, comprising 19 % of the total German forest area. The states with the most municipality forest in Germany are in Southern Germany (Baden-Württemberg, Rhineland-Palatinate, Bavaria) and Hesse. The ranking by states differs in comparing percentage of municipalities with forests and largest average size of forest. In Germany 8,277 (67.9%) municipalities own forest. Compared to Mexico, the average size holdings are much smaller. Many municipalities have less than 200 ha, with an average size of about 222 ha.

Only in a few German municipalities does economic return play a role in the public budget. Altogether the forest revenues make up only 0.5% of the overall municipality revenues (Becker/Lückge 1991). Most wood is sold as roundwood followed by industry wood.[10] Stumpage contracting is only important sporadically with private manufacturing companies and with “Selbstwerber” in a low percentage (about 20% on average).[11] Significant differences exist according to the particular municipality. In recent years, citizens have increased interest in firewood because of high energy costs.

Forests remain an important factor for recreation and conservation in Germany, and there is a strong emotional connection between the citizens and “their” forest. In some instances, citizens protested and ultimately prevented the mayor and the council from selling forest to private people (Ruppert 2006). However, many municipal representatives feel that the legal obligation to manage municipal forests to

[8] “Stumpage” means the sale value of uncut trees in a defined forest section.
[9] “Roundwood” is round sections cut from trees.
[10] “Industry wood” means wood that will be mechanically or chemically transformed for special products.
[11] “Selbstwerber” are individuals who mostly harvest firewood, or small companies.

serve the public interest, like recreation and conservation, is no longer a sufficient justification for financial deficits not least because of increasing wood prices in the last years that lead to expectation of profit.

In rural municipalities, forestry can be an important income source. Overall, there are about 10,000 jobs provided by municipality forests (Borchers 2001). The common silvicultural system is normally selective cutting. The municipality can make use of the state forest service and their workers and machinery. It is possible to hire private harvesting companies and transport companies to haul the wood to a sawmill. The wood-working industry is becoming more interested in stumpage contracting, so such contracting with the municipality may increase over the next few years.

Whether a municipality employs its own forest workers and buys its own machines depends, among other things, on the forest size. The tendency for the large municipal operations is to employ less personnel and machines over time to reduce fixed costs while smaller entrepreneurial firms and the Selbstwerber are continuously increasing employment.

TABLE 2

C. Political representation and management

1. Mexico

Mexican community governance is based upon part of a system of rotating civic responsibility, called *cargos*, under the traditional *Usos y Costumbres* system. The most fundamental decisionmaking body is the General Assembly (GA), made up of official members of the community, typically heads of households. In any particular community, there may be a fraction of non-member residents who do not have voting rights. The GA elects the *Comisariado de Bienes Comunales* (CBC) or *Ejidales* (CBE) and the *Jefe de Vigilancia* (JV), each consisting of a set of three officers (president, secretary and treasurer). The CBC carries out land use management responsibilities, while the JV monitors common property and oversees the CBC. The positions are typically for a three-year term. General civic duties are frequently unpaid and forestry duties are sometimes renumerated. In this case, ownership over productive assets coincides with local managerial control where community integration entails a switch in management personnel from private to community authorities. A scenario, for example, where sawmill communities contract outside companies for extraction services rarely occurs.

Other management roles include the *Jefe de Monte* (JM), or logging foreman, and the documenter who measures the volume of timber extracted. The GA or CBC appoints or elects the JM or documenter. However, in many communities, the oversight and management roles are combined. For example, the *Jefe de Vigilancia* often acts as the documenter or the *Jefe de Monte*. The *Jefe de Monte* is akin to a foreman who oversees and coordinates production.

Extracted volume is usually documented at several points. These often include a locally appointed community member trained for the job and one employee of the buyer, who measures the timber at the delivery point. For communities integrated downstream, one documenter may suffice for deliveries between the felling point and

community sawmill. Sawmills and cranes are usually community-owned, while the other assets -- chainsaws and trucks -- are often privately owned, sometimes by local residents. As communities become more vertically integrated, the GA or CBC may appoint a *Jefe de Patio* (JP), or sawmill manager to organize receiving and milling. Separate sales persons (*Jefe de Ventas*) may also be appointed.

The forestry services in Mexico currently lie in the private sector. The government previously concessioned forestry services to government-employed professional foresters and organized regions into areas under the supervision of one forester. As with the resistance to parastatal forestry, communities lobbied and gained the ability to form their own regional forestry service units. Forestry services became fully privatized in 1992, though many communities have retained the same set of forestry professionals. Concern exists that privatization may open communities to the risk of hiring sub-par services, especially in communities with few resources, while more endowed communities would receive quality services.

Thus, the official role of Mexican state in forestry is mainly regulation and funding. Forestry law requires that all proposed harvests first obtain a permit from the forestry offices of the *Secretaria de Medio Ambiente y Recursos Naturales* (SEMARNAT). To obtain a permit, a qualified forester must prepare and submit a management plan to Semarnat. The Ecological Equilibrium Law defines broad goals and management guidelines. In 2003, the government began a payment for environmental services program (PES), which is still in nascent form. A few communities are starting to receive funds to maintain and protect forest resources which are in danger of major degradation and which provide important environmental services. The *Procuraduria Federal de Proteccion Al Ambiente* (PROFEPA) is an organ of SEMARNAT with the responsibility of investigating claims of illegal extraction of natural resources, like timber or endangered species. Comision Nacional Forestal (CONAFOR) is a suborganization of SEMARNAT and is responsible for Proarbol (which combined the Prodefor and Pronare programs). Procymaf funds management plans, studies, reforestation, and other small-scale activities.

2. Germany

German villages or towns are public corporations whose voted representatives, the municipal council, have the right to decide for their citizens who will serve on the local branch of the public corporation. Thus, the municipal council decides who should manage and harvest the forest, and approves management plans. It can also select a special environmental or forest council, which advises its decision-making processes.

Citizens vote directly for their mayors. The mayor heads the administration and municipal council, and proposes and then implements its decisions. In many states, the mayor also has the right to veto the council's decisions and, in most cases, the council follows the mayor suggestions.

Officially, the municipal council and mayor define the goals for forestry operations but mostly this occurs without clear guidelines. Citizens are allowed to attend council meetings where council members discuss forest issues, but formal citizen participation depends on their interest in forestry. In surveys, citizens listed water

protection, recreation, environmental health and benefits and income as their highest priorities (Dinkelaker, 1999). Psychological factors (e.g. “our forest”) also play a role.

Forestry management in Germany includes tasks to coordinate forest rangers in the field, create a short-term management plan consistent with the long-term plan, and control activities in the forest. Managers usually require a university degree and special qualifications. Managers oversee forest rangers and workers who also meet certain qualifications. The manager also normally has the rights to make contracts with private firms for harvesting and selling wood. He or she on average maintains 10,000 to 15.000 hectares, and quite often contracts a company to fell trees and sell them to a manufacturing company.

Forest rangers perform work in the area. He/she uses the silvicultural system to mark trees to be harvested and coordinate workers. Rangers on average maintain about 1,000 to 1,800 hectares. Rangers can receive their qualifications either through technical colleges or more formal university training. In some places, rangers with only technical college training can also perform the function of managers.

Municipal and state officials are both public officials but they differ in important ways. Municipal officers have a lifelong contract. With changes in law, state officials who are part of the state forest service can be removed. But often the contracts run over ten years without fixed goals and details.

In Baden-Wuerttemberg, Rhineland-Palatinate and Hesse, there are no contracts because the law says the municipal forest should be managed by the state forest service. Many relations between the municipality and the state are based on trust, meaning that state officials often have a good reputation because it is believed that they adopt an informal value called “*Waldgesinnung*”, that is, the value of having official forestry education and belonging to a group that would never work against sustainability.

Accountability is achieved mainly through reporting. When the state manages for a municipality, it must give the mayor/council a report. It must do the same if the manager is a municipal official. The mayor does not need to report to the state. The state controls the process through the management plan review. Citizens can attend the council meeting when the manager makes a report and there is a public document that citizens can view. If a private company manages, it provides the report to the municipality.

The state mainly serves to create regulations that ensure “sustainable” management (in most cases there are no concrete standards), develop and review a long-term (10 years) and a short-term (1 year) management plan for harvests to occur, set standards for forestry managers to manage, coordinate and oversee production, and provide financial support to forest owners when they form an association. Table 3 summarizes the frequency of each possible source of management across German municipal forests where state managers and municipal forest rangers is the dominant form of management.

TABLE 3
D. Associations

1. Mexico

In Mexico, forest associations serve a variety of purposes. While it is difficult to classify any association exclusively into one type of service or another, associations can fall along certain dominant characteristics[12]):

- *Political and market representation:* Numerous grassroots forestry associations have a political history based on a combined effort across communities to improve the terms of trade during the parastatal leasing era in the 40's-80's. Today, some of the same associations address market concerns, like posting current input and output prices and *compra-venta*, where union officials meet with a selling community and a buying firm to sign the contract to create transparency and enforceability.
- *Forestry services:* Many these associations are a reconstitution of a former, state-mandated grouping of forestry services for particular regions of each Mexican state. Within this group variation exists in degree of grassroots development. Some in the past had broader advocacy, technical training and market role which narrowed in later years to focus of technical services (Lopez-Arzola 2005).
- *Processing:* These associations buy raw material from communities, paying a premium over market price to communities, and distribute profit shares to its member communities. Only a few of these type of production cooperatives exist.

2. Germany

In Germany, because many municipalities only own a small piece of forest, horizontal cooperatives to achieve scale economies are important. Most states give financial support to forest owners when they form an association. The association forms are:

- *Forestry association:* Members are private and municipal forest owners. Cooperatives are able to enter into contracts with private entities or other municipalities for the fulfilment of specific tasks, e.g. marketing.
- *Special purpose association:* Members are municipal forest owners. This is an association for municipalities to support their interests where forest issues are only one part. The municipality can be a member of this association by paying a fee.
- *Informal working groups:* In addition to these formally organized associations, the communal managers of municipality forest have created their own informal working groups to learn from each other and collaborate.

There are also political representation organizations in every federal state in Germany: The forest owner associations, a special association for municipalities with forests and private forest owners (in North Rhine-Westphalia and Lower Saxony there is a special organization only for municipality forest) and the municipality association. Both organisations support a policy of extending municipality rights over

[12] See Antinori and Garcia-Lopez IASC 2008 conference paper for fuller discussion of Mexican forestry associations.

forests. Both forms of association act for their members to a different extent in the different states.

E. Other stakeholder groups

Special interest groups including NGOs, hunters, farmers and labor unions in Germany affect management outcomes, especially through FSC forest certification. About 36% of German municipality forest companies and about 66% of the whole forest area owned by municipalities is certified, meaning that the forest has gone through a certification process to assure that their management practices, including extraction activities, follow the criteria of the certifying agency.

External review or capacity-building and advocacy which such groups can provide have distinct variation across states in Mexico. For example, many NGOs operate in Oaxaca and Michoacan, which have unique but endangered wildlife ecosystems (e.g. cloud forests and monarch reserves). By contrast, only a small percentage of Mexico's community forest is certified. Many of those are in Durango; however, Durango has few other forestry-oriented NGOs and special interest groups (other than the private sector) besides the Rainforest Alliance.

IV. Shared issues of measurement and monitoring

Comparing governance structures of community forest management we suggest that the heart of this concern lie with an ability to carry out the oversight roles and measurement of efforts. The problem is not just a matter of "who heads" or "who decides", but also the accountability measures within each governance structure which in turn make a variety of contracting relationships possible in any of the state, local or private arenas. Elaborating the possibilities for monitoring and accountability measures may suggest paths to increased performance and development. Furthermore, we suggest that recent institutional innovations in each country are exactly in response to this need but that further support to these innovations and other innovations could be enhanced. In the following discussion, we first show how Mexican community and German municipality forestry organizations fall into the FJ schemata. Then, we illustrate how German and Mexican forestry governance is changing in response to their constraints on accountability of managers. Finally, we discuss mutual lessons further institutional changes in the context of each culture's governance and political environment.

A. Principals, agents and forestry management

1. Mexico

Figure 1 illustrates how FJ's three main roles play out in Mexico. Members of the community (as principals) elect their representatives (CBC, JV, municipal council) to manage and monitor the forests. The decision management and control roles frequently overlap at the local level. The CBC plays a dominant role in management, with the authority to bring harvesting proposals to the GA, interact with the forester to plan harvests, manage exchanges with buyers and sellers and settle internal agrarian issues.

The *Jefe de Vigilancia* has the responsibility of monitoring the CBC, but in many situations, the JV has not prevented management difficulties. Reasons noted in case studies include collusion with the CBC and an imbalance of power concentrated in a few families who hold authority positions (Merino). Field informants have also suggested internal lack of incentives to increase monitorability when the authorities, CBC and JV, are not paid for their services. Cultural differences may pose a barrier between the social sector and the public institutional infrastructure available to the private sector. Nader (1990) illustrates how "harmony ideology" leads indigenous communities to resolve their problems internally and seek their own solutions to avoid oppressive outside intervention. The state has historically been more of a political presence in *ejidos* and depends on local authorities for delivering patronage. A line of research is whether these dynamics limit external sanctions when internal sanctions are difficult to apply in resolving common property management.

Since ownership is not completely combined with decision management, FJ's hypotheses would recommend integrating all three roles into the same persons or entities, which may be unrealistic, or strengthening the monitoring role and separating it from the decision managers. One small community in Durango has little problem with corruption because with so few people are eligible to be CBC and JVs and everyone has held the position at least once. In effect, the roles of decision control, decision management and risk bearing are combined and decisions are transparent. Many communities in Mexico are much larger, and this combination of roles is not feasible. These develop larger internal organizations that maintain committees and delegate production and management tasks, such as having general managers separate from the CBC, so that the CBC and the CV become decision monitors. However, this organizational evolution is limited to a few of the more experienced communities, who are a small percentage of communities with production activities, even into the milling stage. Therefore, many community organizations effectively combine decision control and decision monitoring while being separated from the full body of risk-bearers, counter to agency prescriptions for optimal organization.

Are there constraints on Mexican communities in exploring alternative management schemes, such as hiring experienced managers for long periods of time? A major reason may be the high cost of hiring outside expertise, in comparison to the low cost but variable performance of local authorities. A further difficulty may be a manager who bridges the two "logics" of market incentives and traditional institutions. In the past, Mexican communities have faced unfavourable trade-offs in forest industrialization. Conditions may exist under which hiring-in services outside expertise, in addition to the cost, entails loss of control over funds and noncontractible benefits of production. Empirical evidence has shown that where communities have basic resources, work experience and a collective knowledge of the industrial aspect of forestry, they are more likely to integrate forward, thereby controlling downstream processing more fully (Antinori and Rausser, 2008). Communities where expertise or leadership skills are lacking have a tendency to forego forward integration, all else equal.

Several communities in Mexico are reconfiguring their production organization, arguably in an effort to separate decision monitoring and management by replacing the CBC and JV with a "localized decentralization" into work groups or temporary

individualized forest parcelization.[13] The rationale is that greater transparency comes from decentralizing decisionmaking. The forester usually maintains one forest management plan for the entire community forest. Once the forester has indicated volumes and areas of cut for one year, work group leaders, individuals and community leaders organize a strategy for harvesting and production. Community members divide the volume equally among themselves.

The basis for forming a work group can be family ties, friendship or simply which group can get the best price, while individuals assigned to parcels can make individual production arrangements (survey data 2008, Wilshusen 2003). These systems exist mainly for the sale of roundwood or stumpage rights rather than for more advanced downstream production requiring higher initial capital outlays. These subgroups directly choose buyers and workers necessary, and sales are transacted at the group level. The community authorities have no control over the flow of funds except the portion used to pay foresters and cover contributions to community funds for maintaining public goods. The work group organizational form has worked with varying degrees of success (Taylor, 2003). Concerns are that sub-community group management leads to underinvest in social services and public works and individual community members being excluded from the full benefit of forestry activities (Wilshusen, Taylor 2003).

2. Germany

Figure 2 demonstrates Germany's moral hazard problem and illustrates the system's basic components. Germany is struggling with a transition to greater local control. Until the beginning of the century, citizens and municipal representatives trusted and received low cost forestry services from the state. Municipal representatives are decision controllers, given that they oversee management activities. They therefore have the power to cancel connections with state management. Moreover, citizens can also act as controllers by complaining to municipal representatives. Citizens are the principals who elect authorities (mayor, council) to manage forest activities. The elected officials are decision makers, and they delegate decision management and harvesting responsibilities to specially qualified managers. To do so, they can theoretically use different contracts or governance structures to ensure that agents will act in accordance with the principals' objectives.

State agencies often combine the decision management and decision control roles. In contrast, agency theory suggests a separation of these two roles in cases where owners are not decision managers.

Despite municipalities' rising dissatisfaction with the financial results of their companies, which call the trust in *Waldgesinnung* into question, the fact that few have explored alternative paths points to dependency on the low-cost services of state forest enterprises (Ruppert 2002, 2006). In some cases, forests are not politically or financially important enough for the municipal representatives to consider fully alternative paths.

Elected officials lack of skills and expertise is a major cause for institutional inertia. The lack of knowledge inside the council means that, as a body, it cannot effectively monitor forest managers. Given the lack of expertise, two options exist. One is to

[13] See Antinori and Fransen (2008) for fuller discussion.

increase elected officials' skills and have state officials continue to manage the forest and the other is to increase officials' technical skills and hire a municipal manager or private company. Under both options, however, moral hazard continues to exist in that it may be difficult to measure managers' work, such as the quality of remaining forest stands.

Hence, a behavior uncertainty problem exists, and mechanisms for monitoring and control are needed. Contracts with private forest companies might bring more economic efficiency but invite "creeping" overuse as private operators try to "please" the community to stay hired or, if in the case of long-term leasing, maximize direct income. This sentiment is reflected in an unofficial assumption in Germany that supposes that municipal or state official forest managers care more about ecology or leisure than monetary returns from production which would increase with harvesting the full sustainable allowable and more efficient use of resources (Ruppert 2006). Many think that private companies are "not to be trusted". Conversely, municipal managers are problematic in that they are often too expensive to act as forest managers.

A lack of clear objectives also limits institutional innovation in Germany. Principals' limited ability to define goals collectively impedes their ability to delegate and oversee. For example, some municipalities do not use harvesting machines because they disturb citizens' recreation. Some local representatives and municipal forest workers place more weight on jobs, job security and income than on recreation. Municipalities often define no fixed goals, and this compounds measurement problems because owners do not exercise their ratification or monitoring rights. In contrast, Mexican community representatives and local members actively define forestry goals to advance their monetary and nonmonetary interests in the forest.

German politicians have questioned whether other institutional arrangements, such as leasing forests to private companies would more efficiently address financial deficit concerns without compromising sustainability. Many municipalities have called for change, and even large municipalities are seeking to reduce costs by hiring fewer workers and divest downstream processing capabilities.

Municipalities are aware of risk of creating their own companies. Thus, they would be well served by thinking about what types of governance structures would most adequately serve their needs. Indeed, paying a municipal official to manage the forests creates fixed costs, and in some cases, a very specific investment because they will hire him for a lifetime under civil service norms. Yet, this step is less drastic than creating a harvest company or purchasing a sawmill, both of which require even greater investments. Municipalities are also concerned about controlling private companies, and many lease their forests only to small service companies that they have known for years.

Many stakeholder groups favor municipalities decreasing vertical integration and, in turn, hiring private companies. Thus, private companies are becoming more interested in receiving orders from municipalities. Private industry has complained to the federal cartel Office that the state forest service engages in unfair competition because its management is subsidized and because it bundles wood to sell in large quantities. To date, there has been no judgment, the state service may be compelled to offer management at the full market price. In the case of selling wood, there will

likely be an agreement that the state is only allowed to bundle municipal forest with less than 3,000 hectares and that the state will have to start projects to help smaller municipalities self-organize to sell their own wood.

Additionally, manufacturing companies are interested in leasing municipal forests. Backward vertical integration is often unprofitable for manufacturing companies because of low returns. With leasing, however, municipalities are concerned with overexploitation because they do not know or trust the companies. Given lack of familiarity and the high costs of hiring a controller to act as monitor, this option is foregone. A possible, though unrealistic, scenario may be that municipalities hold shares in the company and control its actions.

Given that German forests are relatively small in size, municipal and private forest owners may benefit from horizontal cooperation. To date, this has been a slow process.

3. Summary

Germany and Mexico are examples of economic and political organizations that are combined into single local governance systems. German municipalities are trying to move from state to local control, while Mexican agrarian communities, having wrested control rights back from the state, are struggling to enhance their local management abilities. Both types of communities are challenged in the arena of decision control and are struggling to access the necessary expertise.

The moral hazard problem highlighted by both agency theory and transaction cost economics must still be addressed. If either outcome or behavioural uncertainty is high, measurement problems increase if an agent is to be kept to a performance standard. Decision control issues exist for both in-house and external production services. The following section addresses these issues.

B. Examples of the evolution of local forestry governance

1. Germany

Several alternatives are possible for organising the municipal forest company such that accountability is enhanced agency and transaction cost theory mechanisms. For municipalities which own large forest area (greater than 500 hectares), hierarchical control through the formation of a municipally-owned company, which is excluded from the public budget (from an independent establishment to a limited liability), as opposed to a state controlled operation, increases flexibility in responding to the market. The choice of legal form and, with that, the internal controlling instruments, determine municipal legal representatives influence to enforce their goals. For example, cost accounting, target-performance comparisons and advisory boards make the manager's performance more transparent and controllable.

Box 1: Hierarchy and internal control

Municipality Laubach was dissatisfied with the financial results by the state managed forest. They wanted more influence their company and a private manager with more profit orientation. They chose the legal form of a private foundation in order to gain independence from the state forest service and the ability to use specific controlling

instruments. The “Stiftungswald Laubach” received unlimited forest usufruct rights. Property rights underground and on the surface remain with the municipality. The “Stiftungswald” is managed by a private company. The responsibility and administration of a business is carried by a board of directors composed by the mayor, the city treasurer and a member of the municipal council. A special forest technical advisory board consults the board of directors and controls the reporting of the manager and makes spot tests of the quality of management in the forest. The special forest technical advisory board gave the municipality the ability to monitor the manager.

Municipality Uelzen chose the legal form of a municipally-owned company, which is excluded from the public budget in form of a public independent establishment. They install a special accounting system and define scopes of products. The manager suggests what has to be done for each product and how much it costs and the municipal council decides. The product plan also serves as a controlling instrument whether the objectives are achieved.

The internal hierarchical form is not suitable for many municipalities because of the small company size and fixed costs associated. Other possibilities lie in the creation of horizontal cooperation to achieve economies of scale and address price-discriminating practices. Large sawmill companies sometimes pay a higher price than the small sawmills but also require a bigger quantity to be delivered.

However, there is no culture and less encouragement in the municipality to manage their forests together with other municipalities. The main problems are different goals, the fear of losing political power and the own “tradition” of each single municipality (Ruppert 2006).

Box 2: Municipalities in cooperation: Forstwirtschaftliche Vereinigung Mittlerer Schwarzwald (FMS) (Forest Union Middle Black Forest)

FMS is the biggest alliance in Germany of 38 forest associations, including 3,500 communal and private forest owners with the purpose of selling the wood together. The Union has a member assembly consisting of municipality officials, a board of directors and an advisory board. In 2003, they established a Forest Service Liability company, with all 38 associations as partners. This company can harvest and transport wood to sawmills.

Emphasising the question of who is managing the company according to the problem of moral hazard and the incentive of the potential managers to act in sense of the community, simplifying one can differentiate between “pecuniary income” and “non-pecuniary income”. The former may be more pronounced for private enterprises, the latter for companies headed by public officials. The individual utility functions of the agents result in different incentives that should be noted in regards to ensuring quality and securing economic efficiency in achieving the community goals. If the community outsources management without hierarchical organisation (which integrates internal and external controls), then “controlling instruments by the agents” become more important.

Box 3: External control instruments

Municipality Beeskow: This municipality is leasing their forest to a small local private company. As an example of applying an external monitoring mechanism, the contract first ran over 5 years, and, after 2 years, there was a prearranged review which included the participation of neighbouring state forest officials to confirm the company's work. The contract was extended ten years with a similar review every second year.

Box 4: Special securities

Lignis: This private company in Germany offers long-term contracts in which they commit to take all wood from contractually stated parts of the forest even in the case of future calamities which damage planned harvests in those forest stands.

Municipality Bad Orb: This municipality decided to allow a private company to manage their forest after the responsible actors of the municipality visited a forest which the private firm has managed for a long period of time.

"Soft" factors that affect the costs of maintaining accountability are value orientation and "trust" among municipality officials, citizens and outside managers. The latter speaks to a private management company's reputation because many municipalities are concerned that private companies fall short on responsible management and put less effort in assuring the quality of the remaining stand. Socialisations, the reputation of actors and proof of competence can be identified as the basis for relationships to form. Actors either need to know each other or the principal needs to believe that the source of the agent's information is reliable. Evidence of this approach may be said to arise when municipalities know the companies in their region.

Box 5: Trust and value orientation

Municipality Dillinger: This municipality decided in 2002 to give the management to a private company. The manager of the company has lived since years in the municipality. He and his wife are well known and offer special forest days to the municipality to show to the citizen what they are doing in the forest.

Municipality Lauenburg: Interested in ecological forestry practices, this municipality hired a municipal official who was known for his preferences for ecological forestry. The rationale is that in situations where a decision involves a conflict between environmental protection and profit orientation, the official will give the former priority.

For Germany, a main challenge is for the owners, as principals, to better define their goals and objectives. This is currently occurring through the creation of benchmarking circles in parts of Germany, seminars and outside consultants hired to generate ideas. The goal of these efforts is moreover to bring citizens into the discussion of what to do with the forest.

Box 6: Benchmarking circles

The Hessian forest owner association created municipal benchmarking circles. The association director initiated the effort in cooperation with municipalities which wanted to improve financial results. The circles compare natural characteristics of the forest and interests of the municipalities across municipal partners. For example, they

compare forest operational management ratio and working productivity. The benchmarking circle evaluates the performance of managers relative to other managers without monitoring the individual manager directly.

2. Mexico

We now explore features of developing the decision management, decision control and risk bearing roles in Mexican communities.

We first look at internal control mechanisms. As mentioned above, the traditional system of governance seems to lack strong internal mechanisms of control when the CBC and JV, two of the most important *cargos* for forestry, change every three years and there is little training to prepare for forestry management. In some places, the community capacity is stronger than others, allowing communities to vertically integrate and make long term investments.

Box 7: Social capital as basis for in-house management

Community capacity and the industrial organization have a connection. Antinori and Rausser (2008) propose that past historical experience has shaped the "social capital" specifically in relation to forestry in Mexico, facilitating capacity and unified perspective on forestry operations that in turn allowed some communities to make collective, long-term investments and integrate forward into wood products processing, given that other conditions were in place. In a sample of 43 communities in Oaxaca, they found that those who had been concessioned in the past, which is associated with the political participation to oust the parastatal, more often integrated forward, over those with similar natural resources versus finding outside contractors. The result points to control mechanisms directly both outwardly and inwardly. Communities with greater capacity to make decisions collectively prefer to run their own operations rather than risk outside contracting. At the same time, they as a group have better capacity to monitor internal managers. It may also be the case that identity with the struggle against the parastatal created a ideal or performance standard more incorporated into that community's culture.

In many places, internal institutional changes are occurring, with or without changes in end product sold. The work groups in particular suggest a tendency of "creeping privatization" of the communal forest lands. Another response is for the community to decide not to sell processed wood, like roundwood or sawn wood, but to sell standing timber. This eliminates salaries and other potential losses if activities are mismanaged. The work group acts like a hard incentive against the communal authorities like the CBC because in effect the CBC is "fired" from his or her duties. The threat of takeover theoretically acts as a hard incentive for managers in private firms to meet performance criteria, as prices of their company shares fall if the company is not managed well, making it susceptible to takeover (Manne 1965). Shares in a community forestry operation are not traded in the open market, making similar takeovers impossible, but the ability of a community member to align him/herself with various work groups within the community, taking his/her share of volume with him, creates a form of competition among the *Jefe de Grupos* as managers. The concerns stated by community leaders, government officials and NGOs are that forestry management, forestry investment, and investment in local community public goods will suffer, especially if group members become reluctant to

forego profit shares for communal investments, so some communities have rules to ensure a level of work group contribution to community coffers.

Box 8: Work groups as transparency measure

Communities may decide to harvest their timber by work groups rather than collectively as a community operation. Most work groups function by dividing the right to a volume of the authorized harvest equally among all members of the community, who then join a group to see that their share is harvested. Several cases in recent survey of forty-one communities in Mexico had formerly harvested and sold timber as a community but then decided to break in work groups, often choosing to selling standing timber rather than process the timber themselves. Most often, the stated reason for the change was to seek better oversight, accounting and management (survey data, 2008). A recent case involves Pueblo Nuevo, the second largest community in Mexico. Because of major embezzlement of funds, the community is moving away from communal level management to work group management. Its large asset base creates the possibility that work groups will form by function (i.e. one group may be responsible for harvesting timber, another for running the sawmill, etc.).

Some communities have enhanced the monitoring role by creating separate advisory councils to advise and oversee community authorities in forestry matters. Others have appointed or otherwise selected a general manager from their membership.

A few NGOs, like the Rainforest Alliance, have placed internal management on their agenda. While a major focus of RA's forestry program is to certify communities through the Smartwood program, the TREES program aims at improving the technical expertise of the local community in forestry matters, taking into account the local population's use of the forest in livelihood strategies. This effort is consistent with the World Bank's recognition that community-driven development (CDD) depends in part on having locally transparent and accountable governance (World Bank 2007).

Box 9: Building capacity for internal control: Rainforest Alliance (RA)

The Rainforest Alliance - Mexico as part of its efforts at capacity building in forestry has recently worked with a remote community to improve its forestry production and conservation practices. The community of Milpillas in Durango lies about six hours from the capital of Durango, Mexico. RA's program in Milpillas seeks to define annual management programs, finance and install a sawmill, identify clients, improve accounting practices, and raise productivity (Barrera, 2005).

Forestry associations also can fill a gap in information and management. Certain associations offer information on prices. Associations, both based on forestry services and political representation have acted as facilitators in channelling funds from government programs to specific projects in communities. Surprisingly few have developed associations for buying, processing and marketing community timber (see example below). Associations to share service costs has led to a problem with keeping the group together, since communities of different sizes disagree with how costs are balanced against needs of community and the services demanded of each community. In some cases, large communities have broken off because they felt they were subsidizing smaller communities and they wanted differentiated services.

Box 10: Separation of management, ownership and control

In 2006, three major forest communities in Oaxaca, Textitlan, Ixtlan and Pueblos Mancomunados (TIP), formed a consortium to produce furniture. All three have certified forests and their goal, beyond commercializing their resources, is to show that community forestry can be done sustainably, stimulate employment and contribute to economic development in the region. They seek both local and international furniture markets and plans to diversify further in the future. TIP starts from a sizeable asset infrastructure of about $5.5 million among the three communities. The consortium consists of the production arms of each of the three communities, so that day-to-day management is taken out of the traditional *cargo* system while the CBC and other communal representatives maintain an oversight role.

Examples would be to introduce standardized accounting practices with accountants reporting directly to the General Assembly. The accountants, either internal or external, would have to be independent politically and organizationally from the managers. A problem with external accountants has been poor services or embezzlement themselves, raising the question of who monitors the monitors?

In some cases, market incentives provide external controls by establishing standards of performance. For example, communities which go through a certification process to sell wood with the "green heart" label must meet the Forest Stewardship Council's list of criteria for forestry management. The goal is to receive a price premium. However, many communities report not seeing a premium that justifies the cost of certification. Rather, they claimed that the certification process was more useful as an external evaluation of their management performance (Klooster 2006). CONAFOR also has certain management conditions which determine the ability to receive program funding. A role for NGOs and government offices would be to develop business standards for forestry operations to make community operations more competitive with the private sector. Other options are to broaden the scale of efforts to increase local, skills like training local residents in accounting, forestry management, documentation, management.

Box 11: Certification as external control

The FSC has had varied success in Mexico. In Durango, an industry entrepreneur motivated many of the initial certifications, so that Durango now has 25 out of Mexico's 44 certified forests through Rainforest Alliance's Smartwood program (Rainforest Alliance, 2007). Although some communities choose not to renew their certification because of costs and requirements, they have noted that it was a beneficial process for improving their accountability. In the words of one community member, Smartwood acted like a third party assessing their operations from the outside (Klooster 2006).

External controls by the government play a strong suit in protecting environmental services. A recently created government program seeks to link communities into specific management areas aimed at rationalizing conservation in an ecologically cohesive fashion. The management unit becomes a vehicle for focusing conservation and diversification program funding. These could serve to strengthen the conservation base as a monitoring mechanism on behalf of the larger public good. PROFEPA also serves an environmental protection role and is able to

suspend harvesting where severe violations of management practices have occurred, with direct monetary consequences for communities through fines and temporary loss of forestry sales revenue.

Box 12: Private-public exchange of local and technical forest management information as internal control mechanism

Antinori and Rausser (2007) found that more forester-community interaction at planning and silvicultural management stages led to greater local conformance to rules and better ecological performance measurements. For the 43 communities in the study from Oaxaca, the ones where the forester participated more often in General Assembly meetings to discuss forestry matters tended to score higher on measures of illegal harvesting, containment of fires and otherwise following good forest management practices.

What are ways to increase the owners' risk-bearing capacity? Access to capital, along with increased managerial training, is one avenue to enhance local community risk-bearing capacities. Communities' conservation role is incorporated into policy but it is less clear how the social sector is supported as economic agents beyond this stewardship role. Access to financial capital is much more limited to communities for forestry than for individual activities and the agricultural sector. Caps exist on government program grants or loans to communities and limit the potential for major capital investments. Few government programs exist to subsidize or guarantee loans to communities from private banks for large forestry capital investments.

C. Mutual lessons

There are vast differences between Mexican and German communities/municipalities with forest – including political cultural and institutional differences. Yet, several resource management problems faced by each country are similar in principle. Commonalities include:

- High diversity of community structure
- Small management units
- Problem of integrating market-oriented activities into civil governance
- Finding institutional mechanisms to balance incentives and expertise
- Finding institutional mechanisms to create systems of accountability to community goals

What can Mexico and Germany learn from each other if their communities are grappling with the same problems? Our analysis suggests that the measurement and monitoring problem at various stages of decisionmaking challenge these two regimes. Looking at current challenges and examples of institutional responses within an agency framework provides an analytical tool. We discuss "lessons learned" grouped by the possible monitoring mechanisms to reduce moral hazards in section 2 (internal control instruments for organization, external control instruments, nonfinancial controlling instruments by agents and incentive systems ("hard" and "soft incentives").

As a base for *internal control,* an outstanding lesson from Mexico is the community-level process of citizen participation. The legal basis for decisionmaking rooted in the

traditional system of governance and the generally smaller size of the communities as compared to German municipalities makes the process much more direct and decentralized. Due to constitutional rules, many general assemblies meet regularly with attendance of at least half the membership, meaning that most members know the price and volume to be extracted each year and who is the forester in charge. While this broad a level of participation may be infeasible, it is worth considering how to broaden the decision making process so that local citizenry's goals are better articulated and incorporated in Germany. This would also take a more informed citizenry, not just of forestry details but also of decisionmaking procedures to assure access (for examples, see Ruppert (forthcoming)).

In both countries, stakeholders are seeing the need to separate management and oversight. For Germany, that means separating state management from state control. One possibility is contracting a private forest planner or other external institution which the local manager would oversee. To improve the ability for internal control, more technical knowledge about the forests as well as business practices in the municipal councils and general assemblies might be necessary. The greater involvement of foresters may be helpful in both Germany and Mexico for informing community decisions for the purpose of advice, so that decision control and management remains separated. Improved transparency through standardized accounting and reporting systems may be needed. Advisory councils in Mexico are another possible innovation, especially when members have technical knowledge. For Germany, the advisory council might include representatives of the different interests of the municipality.

Focusing on *external control,* the institutional infrastructure in Germany within which everyone has easy access to court systems for verification and enforcement of contracts contrasts with Mexico. The problems speak to various levels of government. The state or federal government could strengthen its enforcement and sanctioning role for community interests so that both private actors and local authorities are held accountable. Such legal backing would also make contractual securities more effective. Lack of enforceability and accountability shifts more risk on to the owners/risk bearers and reduces options for institutional evolution.

Another mutual lesson is a reassessment of the state's role. The Mexican government's CONAFOR programs are part of a monitoring and forestry management strategy to reduce deforestation and support conservation. This offers an example of how the German state can move out of the production business itself and more into a monitoring role from a conservation perspective. Semarnat's permit process puts a clear limit annually on the volume that can be harvested. With this standard set, foresters, communities and companies can move forward with relatively clear harvesting guidelines. In Germany, there is also a plan for the volume of harvesting, which is controlled by state officials. But it is only controlled on the base of quantity, not quality, of inventory. If the manager does not care for the remaining stand and prefers to take only the best trees, it is not easily detected.

Here, *self-enforcing* mechanisms, like reputation, special securities, and informal values (i.e. "soft" incentives) become very important. Germany offers some lessons to Mexico for outside contracting. Mexico, on the other hand, gives many examples of local manager who often represent community goals and values notwithstanding

the limitations discussed. As Germany transitions to more local control, it could learn from examples of Mexican local operations.

Reforms of the German state forest service continue, and one can expect the relationship between state and municipality will also change. Municipalities' need for self-designed ways of fitting locally specific characteristics into the management system will become more important. Growing market power of large sawmills in Germany and the small size of forest municipalities leads to two main predictions. First, German municipalities may adopt the Mexican-style vertical industrial integration into the industry, and, second, expanding regional cooperatives, including cooperatives who hire private companies, raising the importance, once again, of fixing measureable objectives. This second prediction, the expansion of cooperatives with greater market power, has not borne out in Mexico as widely as would be expected given the long history of forestry associations there. Greater heterogeneity of forestry conditions across Mexico, even in the same region, could explain their limitations, as well as other factors (Antinori and Garcia-Lopez, 2008).

Looking at the role of *hard incentives,* German markets are putting pressure on municipalities because many wood buyers only accept certificated wood. In addition, some municipal benchmarking circles give market information both to managers and monitors. Demand for certified wood is less in Mexico. From a production perspective, one possible role for expansion of the state in Mexico would be to improve support for market information and production efficiency. While Mexico has strengthened its conservation agenda, there seems to be a continuing need for communities to secure their role in the market. Additional support through the classic state role of lowering transaction costs could improve profits in the long term and overall welfare. Germany municipalities have an opportunity to avoid hiring officials as managers so that the manager can be fired. There is also a larger scope for contractual relations, from neoclassical contracts with variation in length and details, and special arrangements and securities to reduce the risk of outcome uncertainty. Incorporating these types of contractual relations would more fully protect Germany municipalities in leasing and outsourcing harvesting services in stumpage contracts.

In summary, focusing on the management of the natural resource forest and its connection with measurement problems in a principal agency relation where soft incentives like trust can became very essential, common property regimes can became very important. Mexican vertical integration differs due to the substantial local involvement at all different stages of production. Mexico has switched from a state controlled regime to a more locally controlled common property regime, while Germany in many cases still has a state controlled regime and is struggling with the transition to greater local control. On the other hand also municipal internal control should not be neglected, like accounting systems to make the achievements of goals transparent and guidable by the forest owners.

V. Conclusion

Mexico offers to Germany a variety of decentralized contractual arrangements for their timber operations. A number of local governance processes and structures have evolved in forestry policies and laws that integrate local community members into the decision making process over production and management. The permutations of advisory councils, work groups and integrated community forestry

enterprise with a separate industry for professional services attests to the possibilities.

Germany offers to Mexico ideas for external control like community benchmarking circles and stronger court systems for verification and enforcement of contracts. Certification processes run by NGOs could be adapted as reviews of internal management practices rather than primarily certifying for the green heart label.

There are also differences between Germany and Mexico in the degree of outside political influence. In both countries the communities are vulnerable to political manipulation, but in Germany such influence is connected to the state by indirect subsidiaries, while in Mexico, the role of the influential private sector and political parties has often been directly at the local level of decisionmaking. While we describe the respective forestry sectors in terms of agency and organizational principles, a future line of research is the political arena, where the power of state actors would be fully considered.

In sum, we find that in many respects, decision makers on the local level, but additionally on state level, create the framework for local management in both countries. Analyzing institutional problems in two absolutely different countries employing agency and organizational theory concepts is fruitful in understanding challenges each faces and possible avenues to explore in further institutional innovations. A direct application to other collectively-managed forests is in designing forestry management programs which are accountable to a general citizenry.

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Table 1. Number of Mexican communities with production activity, by state and level of processing capability, 2006

State	No current production	Stumpage Contracting	Roundwood Sales	Lumber or secondary processing	Total
Total	336	643	436	163	1578
% of total (1578)	21%	41%	28%	10%	100%

*Does not include communities with missing data on organization; Source: National Survey of Community-Managed Forests in Mexico, 2006

Table 2. German municipality production activities (fm), 2004

Tree species	Roundwood/ Stick (besides spruce)	Tie-Wood/ Stick (spruce)	Industry Wood		Layer Wood	Other	Total	Firewood
			Long	Short				
Total	6529476	16607	1472172	1278892	704840	976975	11087588	612467
% of total	58,9%	0,15%	13,3%	11,5%	6,4%	8,8%	100%	

Source: Compiled from Statistisches Bundesamtes, 2004

Table 3. Categories of total German municipality forest management, 2006*

Municipalities that own forest	Communal ranger	Communal manager	State ranger	State manager	Private manager
8277	332	36	166	3799	8

Source: Data combined from Ruppert (2006) for Baden-Württemberg, Rhineland-Palatinate, Thuringia, and Saxony-Anhalt; author's (Ruppert) estimation for remaining states.
*Forest associations not reported here manage a few municipal forests in Bavaria, Saxony-Anhalt and Schleswig-Holstein and are led by public corporations (LWK).

Figure 1. Structure and decision making in a Mexican common property forestry operation

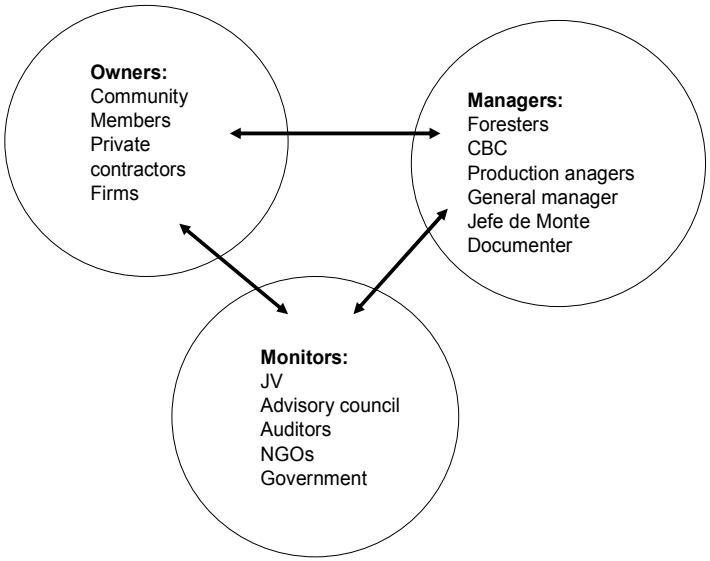

Figure 2. Structure and decision making in German organisation