



## Empirical linkages between devolved tenure systems and forest conditions: Selected case studies and country experiences☆



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### ABSTRACT

In addition to those more rigorous empirical analyses that have been summarized in the previous paper, a large number of case studies have tackled the linkages between devolved tenure systems and forest conditions. Some of the selected case studies and meta-analyses of these and other cases are described, so are the experiences of forest tenure devolution in several countries. We argue that complementary to those empirical analyses reviewed earlier, these two elements are also essential to anyone who is interested in a clear understanding of the specific contents, contexts of forest tenure devolution in different parts of the world and the possible causal linkages between devolved forest rights and improved forest condition.

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## 1. Introduction

Across the globe, devolution, in one form or another, has been advocated and implemented (Agrawal et al., 2008). In addition to those more rigorous empirical analyses that have been summarized in the previous paper, a large number of case studies have tackled the linkages between devolved tenure systems and forest conditions. Here, we intend to describe some of the selected case studies and country experiences of forest tenure devolution in this paper. We believe that complementary to those empirical analyses reviewed earlier, these two elements are also essential to anyone who is interested in a clear understanding of the specific contents, contexts of forest tenure devolution in different parts of the world and the possible causal linkages. Once again, it is worth noting that in our view, the literature of case studies is different from the primary literature selected for detailed review earlier; as such, we did not place much attention upon evaluating their strengths and weaknesses.

In the next section, we discuss some case studies as well as some meta-analyses of these and other cases, based on their geographical relevance. For reader's information, all the cases covered are summarized in Appendix A. Then in Section 3, we present the diverse devolution processes of tenure and property rights systems and the subsequent

ecological outcomes, based on the experiences of several countries in Latin America, Asia, and Africa.

## 2. Selected case studies

### 2.1. Latin American cases

In *Development policies and tropical deforestation in the southern Yucatan Peninsula: centralized and decentralized approaches*, Klepeis (2003) used the case of the southern Yucatan Peninsula to illustrate the need for historical analysis in identifying key drivers of deforestation. According to him, the most important land-use changes in the region over the past 100 years are connected to shifts in national development policies. These shifts represent tensions between centralized and decentralized approaches to land management—as reflected by the policies of Presidents Diaz (1876–1910) and Cardenas (1934–1940). The legacies of these recurring development strategies included depleted hardwood reserves, large areas of permanently cleared forest, and long-standing tensions between economic, social welfare, and environmental conservation goals. While centralized and decentralized approaches both focused on natural resource exploitation, the rates of deforestation tended to be faster, the patterns of forest clearing more pronounced, and land-use decision making less democratic under systems of centralized control. As profound as these observations may be, the evidence presented was not particularly robust or compelling without carefully testing the complicated causal relationships.

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In *Property rights, land conflicts and deforestation in the eastern Amazon*, de Oliveira (2008) demonstrated that insecure property rights are among the main causes of land conflicts and deforestation. Through an in-depth case in Maranhao in the Eastern Amazon, he analyzed how distorted agrarian, forest, and environmental policies, laws and regulations led to insecure property rights not only over land, but over timber. These policies, allied to social and political factors—such as uneven distribution of land and the strong organization of the landless—led to land conflicts and deforestation. He also elucidated that the causes of and actors involved in the deforestation of the Amazon were not independent from one another. The policy distortions fostered an environment of insecure property rights whose adverse consequences included a lack of incentives for private investments in land improvements, rent dissipation in organizing invasions (in the case of the landless) and in protecting properties against invasion (in the case of the landowners), violent social unrest in some cases, and, ultimately, uncontrolled deforestation and land degradation. Hence, this study found that coordination between environmental goals and agrarian policies, regulations, and laws are necessary to provide secure and clear property rights, which may allow better enforcement of environmental regulations and may provide incentives to actors to avoid deforestation.

In *Explaining community-level forest outcomes: salience, scarcity, and rules in eastern Guatemala*, Gibson et al. (2007) began with Ostrom's earlier notion that the attributes of the natural resource and of the appropriators of that resource that might affect the likelihood of whether or not an individual would choose to invest time in a collective solution. Then, they pointed out that two of the attributes are more than just additional influences on individuals' cost-benefit calculations; rather, they are necessary to motivate—communities do not create restrictive institutions concerning a resource unless: (1) the community members depend significantly on the resource; and (2) there is a perceived scarcity of the resource. The second of these two conditions did not apply to the Morán case, and, as a result, their forest was open to all members to use. In comparison, the two conditions did hold for agricultural land in the area, and a number of locally constructed restrictive institutions guide the management and exchange of this valuable resource. Based on the IFRI data, their tests (in which pine diameter at breast height [DBH] was a function of stand density, elevation, steepness, insects, distance to settlement, distance to road; and stand density is a function of elevation, steepness, insects, distance to settlement, distance to road) detected that biological and physical variables explain most of the variation, with little left to institutional effect.<sup>1</sup> Their results are appealing because of their proper analysis and strong warning to those institutional scholars who ignore the effects of biophysical and socioeconomic factors.

In *Land tenure and forest cover change: the case of southwestern Beni, Bolivian Amazon, 1986–2009*, Paneque-Gálvez et al. (2013) assessed whether significant differences in trends of forest cover change could be partially explained by different land tenure arrangements. They examined spatiotemporal dynamics of forest cover change (FCC) across four land tenure systems (indigenous titled territory, PA, logging concession, and private land) by classifying forests using Landsat imagery from four years (1986, 1996, 2001, and 2009). The results showed that (1) private lands underwent, by far, the largest FCC; (2) indigenous territories and the PA had little FCC; and (3) logging concessions were responsible for the lowest FCC. These findings implied that land tenure played a key role in FCC except in private areas, where many other drivers had operated. It is encouraging that this study discriminated between early growth and old-growth forests, which is crucial to address not only deforestation but also forest degradation and re-growth. Without careful modeling, however, the qualitative analysis of the impact of

each driver on FCC within the five study areas was not particularly strong.

In *Inhibition of Amazon deforestation and fire by parks and indigenous lands*, Nepstad et al. (2006) used satellite-based maps of land cover and fire occurrence to compare the performance of large (> 10,000 ha) uninhabited (parks) and inhabited reserves (indigenous lands, extractive reserves, and national forests) in the Brazilian Amazon. Reserves had significantly lower deforestation and fire impacts. Deforestation was 1.7 (extractive reserves) to 20 (parks) times higher along the outside vs. inside of the reserve perimeters, and fire occurrence was 4 (indigenous lands) to 9 (national forests) times higher. However, uninhabited reserves tended to be located away from areas of high deforestation and burning rates. In contrast, indigenous lands were often created in response to frontier shift, and many acted to prevent deforestation despite high rates of forest loss along their boundaries. The inhibitory effect of indigenous lands on deforestation was strong after centuries of contact with the national society and was not correlated with indigenous population density. Indigenous lands occupy one-fifth of the Brazilian Amazon—five times the area under protection in parks—and are currently the most important barrier to deforestation in the Amazon. Thus, the authors predict that as the PA network expands in the Brazilian Amazon over the coming years, the greatest challenge will be successful implementation of reserves in high-risk areas of frontier expansion as indigenous lands rights are strengthened.

## 2.2. Asian cases

In *Lowland forest loss in protected areas of Indonesian Borneo*, Curran et al. (2004) found, using satellite imagery, that during 1985–2001, the study area lost 56% of its forest cover due mostly to logging and oil palm plantations. They attributed the accelerated deforestation rates to decentralization reform and described how the reform allowed local governments (districts) to issue small logging permits that caused the “unauthorized harvest of remaining accessible lowlands” (p. 1002). Similarly, McCarthy (2004) revealed that in Central Kalimantan of Indonesia, decentralization produced a race to the bottom in the forest sector due to ambiguity in the rights and rules over forests, which have shortened actors' time horizons and led them to a “race to make the most of current opportunities without regard to future operations” (p. 1215). Tacconi and Kurniawan (2006) also illustrated that in Indonesia, the period in which decentralization was introduced coincided with a significant deterioration of the rule of the law, a trend that started during the final years of the Suharto regime. Palmer and Engel (2007) quantified the impacts of mechanized logging on forest-dependent communities in Indonesia. They suggested that significantly more households received financial and in-kind benefits after decentralization compared to before, and little evidence existed of a post-decentralization trade-off between environmental and financial contractual provisions. In this case, the weak implementation of decentralization and a decline in rule of law associated with new and ambiguous rights led to an overall decrease in forest condition, as rights were devolved.

In *Landscapes of protection: forest change and fragmentation in Northern West Bengal, India*, Nagendra et al. (2008) attempted to relate different tenure arrangements to forest change and fragmentation between 1990 and 2000 in a landscape surrounding the Mahananda Wildlife Sanctuary in West Bengal. This protected forest was bounded to the south by the Baikunthapur Reserve Forest (a less intensively managed PA), and surrounded by a mosaic of unprotected, largely private land holdings. Their results indicated differences in the extent and spatial pattern of FCC in these three zones, corresponding to different levels of government protection, access, and monitoring. The two PAs experienced a trend toward forest re-growth, relating to the cessation of commercial logging by park management during this period. Yet, there was still substantial clearing toward the peripheral areas connected to illegal timber markets by transportation networks. The surrounding

<sup>1</sup> Similar empirical results were contributed by Coleman (2009), who found that average forests with local users that monitor and sanction are more likely to sustain basal area and biodiversity.

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