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Does secure land tenure save forests? A meta-analysis of the relationship between land tenure and tropical deforestation

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ABSTRACT

Deforestation and degradation are tied to a complex array of socioeconomic and political factors. Many assume that among the most important of these are the particular bundles of rights regulating who can benefit from land (tenure form) and the overall assurance that those rights will be upheld (tenure security). This paper reviews literature that connects forest outcomes and land tenure to better understand broad interactions between tenure form, security and forest change. Papers from economic theory suggest tenure is embedded in a broader socioeconomic context, with the potential for either a positive or negative conservation impact on forested land. Empirically, we find 36 publications that link land cover change to tenure conditions while also controlling for other plausibly confounding variables. Publications often investigate more than one site and more than one form of tenure, so from these we derive 118 cases linking forest change with a specific tenure form in a particular location. From these cases, we find evidence that protected areas are associated with positive forest outcomes and that land tenure security is associated with less deforestation, regardless of the form of tenure. We conclude with a call for more robust identification of this relationship in future research, as well as set of recommendations for policymakers, particularly as forest carbon incentive programs such as REDD integrate further into national policies.

1. Introduction

Land tenure and forest property rights are critical issues for the new wave of incentive-based policy instruments that aim to safeguard ecosystem goods and services in tropical forests (such as carbon, water, and biodiversity) by paying people to protect them. One of the most recent and highest profile of these instruments, Reducing Emissions from Deforestation and Degradation (REDD), has attracted significant investment as well as critical scrutiny (Marino and Ribot, 2012). Property rights over forests directly determine who is eligible to receive protection incentives and who is responsible for meeting programs' contractual obligations. Clear and secure land tenure is crucial for an efficient REDD program and equitable distribution of benefits (Bruce et al., 2010). Yet the world's most carbon-rich forests are often found in regions where ownership is ill-defined, contested or insecure (Fig. 1). Some describe current 'chaos' in property regimes (e.g. Fitzpatrick, 2006), particularly in areas amid transitions from customary norms where legal codified rules are not yet operative.

For these reasons, policymakers see land tenure and relatedly, carbon tenure, as key issues shaping the social and environmental impact of REDD and related programs (Sikor et al., 2010; Sunderlin et al., 2009; Unruh, 2008). Yet tenure and forest outcomes are connected to a complex array of socioeconomic and political factors. Interventions to "clarify tenure" are rarely a simple administrative or technical challenge and warrant a cautious approach, especially since titling programs show varied outcomes in improving landholders' livelihoods (Deininger and Feder, 2009). Moreover, land is more than an input to agricultural or forest productivity. Land has social, cultural and political value, and is particularly central to indigenous rights movements (Platteau,

Abbreviations: PES, payment for ecosystem services, payment for environmental services; REDD, Reducing Emissions from Deforestation and Degradation.

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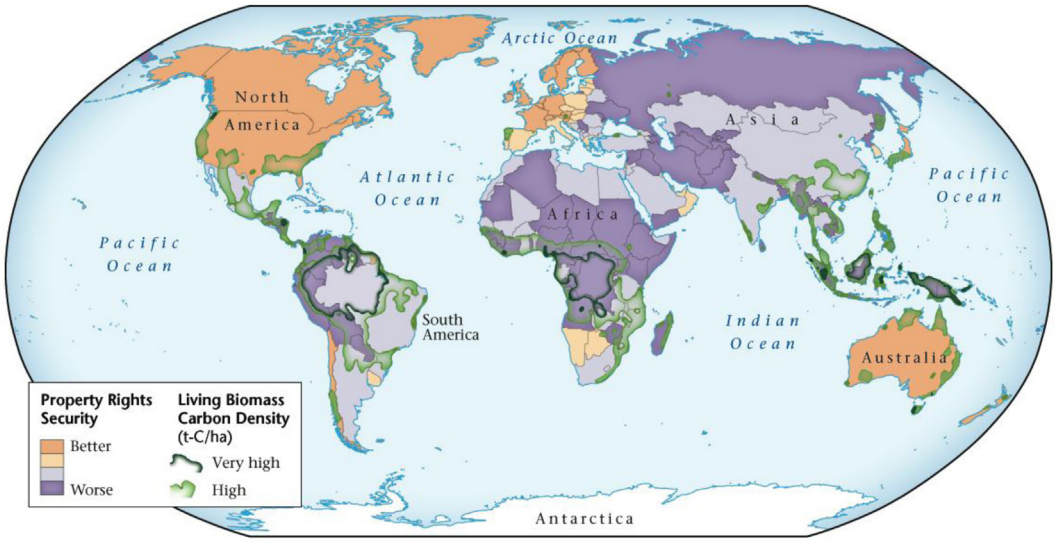

Source: Bruce et al. 2010.

Fig. 1. Tenure security and carbon biomass density.

2000) and ways of life that are not necessarily compatible with fixed land rights (Fox et al., 2013) (this issue).

Addressing tenure issues is pivotal for the success of payments for ecosystem services (PES) or REDD programs, since landholders must have the authority to make land use decisions and defend land against outside claimants or other agents of land use change. In the context of these incentive-based approaches as well as more standard command-and-control type policies (Börner et al., 2013) (this issue), there seems little alternative to improving and supporting state-recognized land tenure rights. Yet drawing clear lessons from previous research is hindered by confused or ill-defined basic tenure and deforestation terminology. Further, it is unclear whether specific forms of tenure are more "sound" or how much tenure *security* matters. There is increasing evidence that indigenous groups and those acting collectively can be successful at managing forest resources, but this also requires security in their land claims (Nepstad et al., 2006; Sandbrook et al., 2010; Wynberg and Laird, 2007). Protected areas generally help avoid tropical deforestation over other land tenure forms (Andam et al., 2008; Joppa and Pfaff, 2011), but some may simply displace deforestation and extensive tracts of carbon-heavy, biodiverse forest lie outside of areas under strict protection (Agrawal, 2007; Soares-Filho et al., 2006; Sunderlin et al., 2008b). We need a better understanding of how the form of tenure and tenure security interact to affect forest outcomes.

Our aim with this review is to identify these relationships and, in doing so, outline the specific contexts in which land tenure interventions can help slow deforestation. We follow the U.S. Agency for International Development (USAID, 2008) in referring to *land tenure* as the set of institutions and policies that determine how land and its resulting resources are accessed, who can benefit from these resources, for how long and under what conditions. To gain analytical traction we construct two null hypotheses: (1) there is no association between the *form* of land tenure and the likelihood of forest conservation, and (2) there is no association between the *security* of land tenure and the likelihood of deforestation. We evaluate these hypotheses in relation to existing theoretical and empirical literature.

We first briefly review tenure terminology and distinguish the form of tenure from tenure security (Section 2). Section 3 reviews the theoretical economic literature on tenure security and land use change to provide an underpinning for our discussion. Turning to the empirical literature, Section 4 discusses the methods for our review and empirical relationships between the form and security of tenure and forest outcomes. In light of the notable variation in tenure forms and level of tenure security between regions (Sunderlin et al., 2008a), we examine variation in the tenure–forest relationship between geographic regions as well as across them. Section 5 offers broad lessons from our review and Section 6 concludes with suggestions for future research and policy.

2. Basic terms

The debate regarding the impact of tenure on forest conservation is hindered by inconsistent use of terminology. *Property rights* and *land tenure* are often used interchangeably and, moreover, are often used to imply rights for individual landholders only. *Property rights* refer to a bundle of rights guiding the use, management and transfer of assets. *Land tenure*, as previously noted, is the set of institutions and policies that determine locally how the land and its resources are accessed, who can hold and use these resources, for how long and under what conditions (Bruce et al., 2010; USAID, 2008). Land tenure, then, is a set of property rights associated with the land, and the institutions that uphold those rights.

Both *land tenure* and *property rights* may refer to any number of bundles of rights, only one of which is what we typically think of as individual private property rights. The *form* of land tenure then refers to the rules and norms associated with any number of entities, such as an individual, a public institution (e.g. the national park service), a private company, a group of individuals acting as a collective, a communal or common property arrangement or an indigenous group. Public and communal tenure are prominent in the tropical forest management literature given that they often constitute large land areas (e.g. $\geq$10,000's ha). Such scale is ultimately attractive to PES and REDD initiatives, given the lower transaction costs of implementation and maintenance of ecosystem function. Public and communal landholdings are generally nontransferable, which also has special significance for REDD as carbon contracts are designed to be long-term.

While land tenure can take on a number of forms, we define *security* in land tenure as the assurance that land-based property rights will be upheld by society. Security does not refer to the duration, marketability or the breadth of rights over a piece of land; these are all components of a particular form of tenure

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