

FOREST COVER CHANGE AND TENURE:

A REVIEW OF GLOBAL LITERATURE

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HELVETAS
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HELVETAS Swiss Intercooperation Nepal produced this booklet collaboratively with Rights and Resources Initiative. This aims to highlight key issues, achievements, and opportunities in the field of forest cover change and tenure.

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HELVETAS Swiss Intercooperation is a Swiss association devoted to development and cooperation. It works towards the elimination of the causes of marginalisation and promotes solidarity with the poor in the south and the east. Its mission is to actively contribute to the improvement of the living conditions of economically and socially disadvantaged people in Asia, Africa, and Latin America. Currently, it runs programmes of co-operation in 30 countries including Nepal.

Through publications, it contributes to the generation of knowledge and the process of learning through sharing on development and co-operation. For more details or comments, please contact:

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The Rights and Resources Initiative (RRI) is a strategic coalition comprised of international, regional, and community organizations engaged in development, research and conservation to advance forest tenure, policy and market re- forms globally.

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In the REDD+ era, the issue of forest tenure has shot to the top of international forest policy agendas. Clarity of tenure is considered a requirement for a compensation system that would pay forest “owners” for forest conservation because in many parts of the world this ownership is fragmented between different stakeholders and different authority claimants, in practice if not on paper. Indeed, complex tenure arrangements are more the rule than the exception (Unruh 2008). However, beyond the issue of “REDD readiness,” there is much debate on the role of tenure in other outcomes of sustainable forest management, in particular livelihoods and forest conservation. Our focus here is on the latter concern, and this document aims to provide a brief overview of the international literature on the question of the relationship between forest tenure and forest cover change. The objective is to discover whether there is evidence that particular forest tenure regimes have

significant relationships with forest cover change; in other words, whether they are successful at halting deforestation.

This overview of the international literature is designed to complement a particular case study carried out in Nepal that analysed forest cover change in Dolakha district between 1990 and 2010 (Niraula and Maharjan 2011). Based on a remote-sensing and GIS-based methodology that digitally mapped forest cover and tenure regime boundaries, this case study found that compared to government forests and private forests, community forests had relatively higher rates of afforestation and lower rates of deforestation. The authors attribute this to forest user group management, monitoring, and prevention of encroachment. These findings corroborate an earlier photo monitoring analysis that compared photos landscapes over time to assess forest cover change (Pokharel and Mahat 2009).

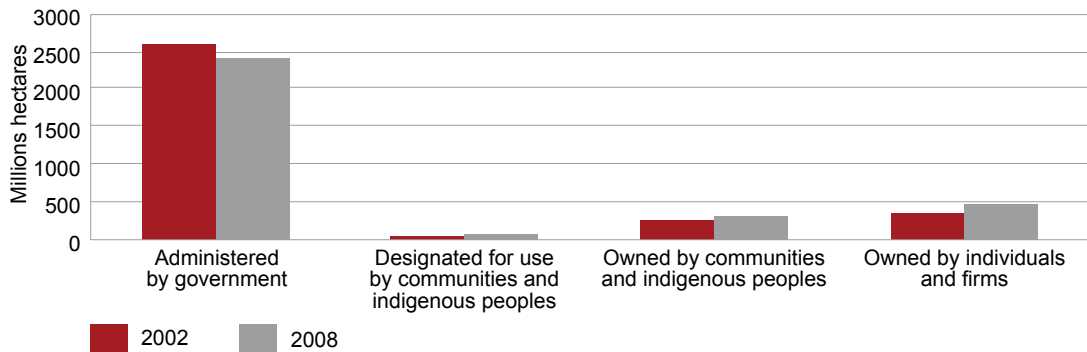
Before continuing, a few words of definition. Forest tenure refers to the social relations and institutions governing forestland and resources. Tenure determines who is allowed to use which resources, in what way, for how long and under what conditions, as well as who is entitled to transfer rights to others and how (Larson et al. 2010). Tenure can be considered as a bundle of rights, a bundle which includes access, use, management, exclusion and alienation (Schlager and Ostrom 1992). Rather than being held exclusively by one stakeholder, different parts of the bundle of rights can be held by different actors, as when a state grants access, use and management rights to community groups on what remains state-owned forestland. Furthermore, the bundle of rights may also include a combination of rights that are defined by statutory law (*de jure*) and *de facto* rights that are defined locally, through practice. For the sake of analysis, it is helpful to sketch out tenure regimes that denote a certain shuffling of the bundle of rights. For example, Sunderlin et al. (2008) propose to distinguish between

- Public lands administered by government (which can also include

some protected areas and forest lands awarded as concessions for extractive industries)

- Public lands designated for use by communities and indigenous people: land set aside on a semi-permanent but conditional basis and where governments generally retain strong authority
- Private lands owned by communities or indigenous peoples: forest lands where (in theory) rights cannot be unilaterally terminated by a government without some form of due process and compensation (so a more extensive bundle for communities than above)
- Private lands owned by individuals or firms: where the rights cannot be unilaterally terminated by a government without due process or compensation.

Globally, the vast majority of forests are still owned and administered by states, as is illustrated by the graph below. However, as Sunderlin et al. conclude, this graph indicates that the forest transition from state owned and administered to other tenure regimes continues. Furthermore, as this graph only shows statutory forest tenure according to state policy, it doesn't

FIGURE 1 | Forest tenure distribution by tenure category in 25 of the 30 most forested countries¹

Source: Sunderlin et al. 2008

capture the fact that much of what is officially state administered forest is actually managed by local communities due to a “scarcity of the state” (Corbridge et al. 2005), or lack of state capacities to effectively administer forests themselves.

Other authors, whose findings we will be citing later, group tenure regimes differently. For example, Robinson et al. (2011) distinguish between public, private, protected, and communal, whereas Porter-Bolland et al. (2011) assess only the difference between protected and multi-use tenure regimes. The main point is that tenure is a highly complex issue, wherein different actors have different rights (and claims) according to different legal systems, as well as in practice, that can also vary over time (i.e. seasonally).²

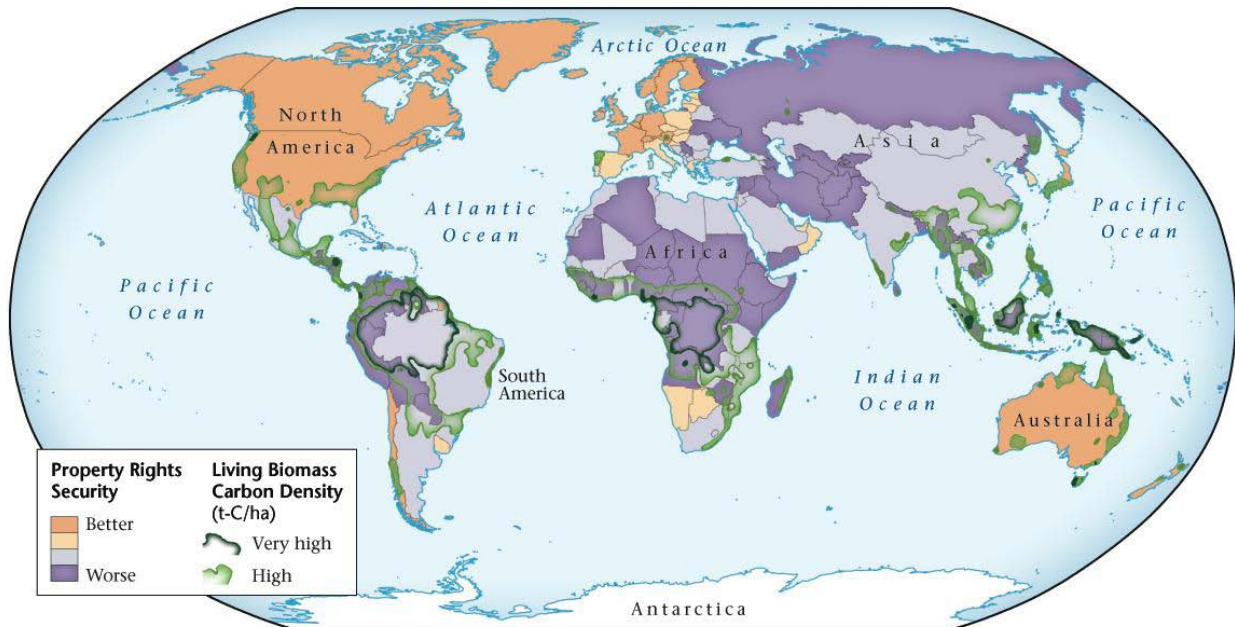
Beyond the particular constitution of the bundle of rights itself, is the issue

of tenure security. As we will outline further below, several authors claim (for example, Broegaard 2005) that it is tenure security and more specifically the forest users’ perceptions of tenure security that is key to forest users’ decision-making. Tenure security refers to the assurance that norms governing tenure, governing the allocation of the bundle of rights, will be enforced (Robinson et al. 2011). The implications of this are clear from the figure on the following page: much of the world’s richest forests are in areas with less tenure security. These are places where it is not really clear who has the authority to make decisions about the future of the forests, both from the point of view of livelihoods and of conservation. What is clear is that, as Casse and Milhøj (2011) observe, countries with the largest and densest areas of forest are not necessarily those most that recognize community rights.

¹ These 25 countries, in order of forest area, are Russia, Brazil, Canada, United States, China, Australia, Democratic Republic of Congo, Indonesia, India, Sudan, Colombia, Angola, Bolivia, Venezuela, Zambia, Tanzania, Myanmar, Papua New Guinea, Sweden, Japan, Central African Republic, Congo, Finland, Gabon, and Cameroon. Note that just eight countries (Australia, Bolivia, Brazil, Cameroon, Colombia, India, Sudan, and Tanzania) account for almost all of the net increase in the area of lands designated for and owned by communities and indigenous peoples.

² An interesting methodology for mapping such complexity is proposed by Barry and Menzien Dick 2010.

FIGURE 2 | Security of property rights and living biomass carbon density



Source: Bruce 2010 cited in Robinson et al. 2011

For this study, we have taken “positive” forest cover change (afforestation or reforestation) as the key indicator of improved forest condition. We have taken this indicator to keep in line with the study by Niraula and Maharjan (2011), which this literature overview intends to complement. Niraula and Maharjan measure forest cover change with Landsat images and aerial photographs (and cross-reference this with qualitative assessments of forest users), a method that many of the case studies reviewed also use. This qualitative cross-referencing with forest users (or

foresters) is important because remotely sensed estimates of forest cover change only reflect land cover and not how the land is actually used. Forest cover change describes only the conversion from one kind of land cover to another. Additional important aspects related to the use and management of the forest, for example forest degradation or a change from an old-growth forest to an agro-forestry operation, are not reflected. For this reason, some of the studies cited also use other indicators of forest condition change such as forest density and biodiversity.

3 An overview of the literature

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This overview has drawn findings from two types of sources: recent literature reviews or meta-analyses of published case studies on the topic (Casse and Milhøj 2011, Porter-Bolland et al. 2011, Robinson et al. 2011) and recent studies drawn from international data sets maintained by the International Forestry Resources and Institutions (IFRI) research programme (Persha et al. 2011, Coleman 2009, Hayes 2006, Ostrom and Nagendra 2006), the Centre for International Forestry Research (CIFOR), and the Rights and Resources Institute (Larson et al. 2010). Each of these publications has a slightly different focus, but their findings can be brought into productive discourse.

The body of literature on the relationship between tenure and forest cover change in general is large, even if restricted to studies published in peer reviewed international journals and in the English language, referenced in Google Scholar or Web of Science. This overview is limited to studies published in peer reviewed international journals to ensure that the findings cited here have gone

through a rigorous assessment of their methodology and results. The so-called “grey literature” published by development or advocacy organisations, for example, has not been reviewed here.³ Many of these references are included in the bibliography in part 3 of this overview, though this cannot claim to capture them all. The body of literature is dominated by small-scale case studies, with relatively few internationally comparative studies. These internationally comparative studies are usually based on comparisons of existing published case studies (meta-analyses), although research based on studies designed to be globally comparative is starting to be published by researchers associated with institutions like the IFRI and CIFOR/RRI.

Looking at the available literature published in peer reviewed journals, we can see that there is a certain over-representation of Latin America and South Asia (in particular India and Nepal) in the case studies. For example, 21 of the 56 published case studies evaluated by Casse and Milhøj are from Nepal (2011). In contrast, the scientific interest

³ The one exception being Robinson et al 2011.

in assessing or evaluating other country experiences, for example Indonesia or China, has been relatively limited and there are few published case studies from these countries. Another interesting trend in the literature is that publications on this topic have multiplied in recent years. This is likely due to the increasing availability of satellite imaging data as well as the increased salience of the issue of tenure in a REDD+/PES world. The focus of this literature review is on empirical studies

(i.e. not theoretical works), but these employ a very wide range of methods, both qualitative and quantitative, which makes comparison across them very challenging.⁴ Since to review all of this literature comprehensively is beyond the scope of the present overview, we restrict ourselves here to summarizing the findings of existing literature reviews, as well as a selection of the studies that have a global (rather than only local, national, or regional) perspective.⁵

⁴ For a discussion of methodological issues in the reviewed literature, see Casse and Milhoj 2011.

⁵ Reviews of particular national literature are thus beyond the scope of this brief international overview.

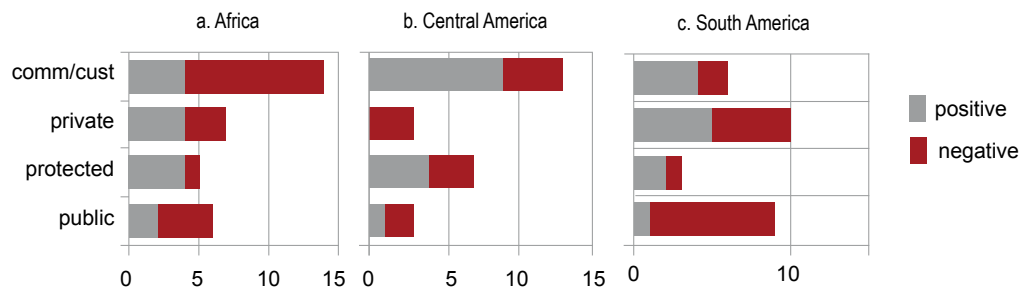
4 Key findings

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Globally, the relationship between tenure regime and forest cover change is mixed and there is no clear evidence to suggest that a specific tenure type will ensure forest conservation.
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In the words of Elinor Ostrom (2010), “our research shows that forests under different property regimes – government, private, communal – sometimes meet enhanced social goals as biodiversity protection, carbon storage, or improved livelihoods. At other times, these property regimes fail to provide such goals.” Eric Coleman (2009) further specifies, “Conditions in community-managed forests are not statistically different from government or privately managed forests. This implies that local communities can play an important role in achieving positive forest conditions but that full management responsibilities need not be given to achieve these results.” This finding is corroborated by the other literature reviews and global comparative studies summarized here.

For example, the review of literature by Casse and Milhøj (2011) on the relationship between community forestry and forest conservation concluded that in the 56 case studies from developing countries, there is no systematic correlation (negative or positive) between presence of community forestry projects and forest conservation, whether defined as lowering deforestation rates/increase in biomass or improved forest conditions (perception based valuation).⁶ Likewise, in their review of literature on the relationship between tenure and forest cover change, Robinson et al. (2011) found that there are both positive and negative outcomes for forest cover across all the most common types of tenure. In other words, there is no clear evidence to suggest that a specific tenure type will ensure forest conservation as negative forest cover outcomes are found in all tenure types. They do find, however, that public frontier land is generally more associated with negative forest outcomes and that protected land has slightly more positive outcomes than negative. Robinson et al. also found a certain regional variation to the

⁶ These case studies were from the following countries: Nepal, India, Mexico, Bolivia, Mali, Mexico, Tanzania, Philippines, Indonesia, Brazil, Guatemala, Honduras, and Malawi.

FIGURE 3 | Forest cover outcomes in different tenure regimes and regions

Source: Robinson et al. 2011⁷

relationship between tenure regime and forest cover change. Robinson et al. present their analysis of the relationship between different forest tenure regimes and forest cover change (positive or negative) in different regions in Figure 3.

Regional variation is also noted by Larson et al. (2010), who analysed data from more than 30 sites in 10 countries in which tenure reform was giving greater forest rights to communities.⁸ These authors found that the most obvious pattern in outcomes is that results were more often positive for forests in Asia, mixed in Africa, and resulted in no change in Latin America. Larson et al. examine the underlying variables behind these differences, which we will briefly summarise here. In the three Asian case studies (Nepal, India, and the Philippines), the indicators of forest conditions clearly improved in almost of the data collection sites.⁹ Larson et al. find that under reformed tenure, forest cover has increased, natural regeneration has

been protected, landslides have been reduced, and some of the endangered flora and fauna have been safeguarded. One important, and obvious, reason is that most of these forests were highly degraded when handed over to communities. Other authors highlight the particular success of the Nepal case as well. For example, Casse and Milhøj (2011) note that Nepal comes closest to successfully coupling forest conservation with community management of forest, at least as far as the papers in their literature review indicate.

Larson et al. (2010) report mixed outcomes across the African countries they studied, as well as mixed results between sites within countries. They suggest that in Cameroon, deteriorating forest conditions in community forests may be partially a result of the tenure reforms and how they were implemented. However, degradation was already occurring, in the sites studied forest management tends to be dominated by a

⁷ Robinson et al (2011) leave out South Asia because they find that the overwhelming majority of studies in this region focus only on community tenure, making comparison difficult.

⁸ These ten countries are: India, Nepal, Philippines, Burkina Faso, Cameroon, Ghana, Bolivia, Brazil, Guatemala and Nicaragua.

⁹ For more information about the specific sites, please refer to Table 1 in the article cited.

few profit-seeking individuals and forest management plans are not properly implemented. In Burkina Faso, one concession site shows improvements and two are deteriorating. In the former, conservation of its wildlife habitat is a priority because it is a wildlife reserve that generates royalties from safaris. Furthermore, the community is well organized, customary authorities are fully involved in implementation, and exclusion rights are exercised. The two cases with increased degradation involve concessions for fuel wood exploitation in which there is a conflict between the state's claims to own and manage land and forest resources and customary rights and practices. The Ghana site, which has demonstrated improvements in forest condition, is located in a protected area and involves planting trees in agricultural fields under an agreement in which farmers have the right to a portion of the income generated from future sales of the wood produced.

The Latin American sites included in the analysis by Larson et al. (2010) generally saw forest conditions maintained, in spite of an improvement in livelihood provisions. It is notable that in these sites the forests were in relatively good condition when they were handed over to communities, unlike the forests in the Asian cases. This is particularly true, write Larson et al. in Pando, Bolivia, where Brazil nut collection is the primary source of livelihoods and there is thus an economic incentive for forest conservation. However, maintaining forest condition is still an important achievement because these forests are under pressure from other outside actors due to their high commercial value. Forest condition in the Petén, Guatemala sites is better than

other sections of the Mayan Biosphere Reserve. There is lower deforestation in the multiple-use zone of this Reserve, where the community forest concessions are located, than the national park and buffer zones. These other two areas are being invaded and converted to other uses. Similarly, in many of the other sites in Brazil, Bolivia and Nicaragua, pressure from logging and land interests are increasing, particularly for community forests close to roads and settlements.

Overall, from the data discussed by Larson et al. (2010) we can see that the tenure regime itself is not necessarily the most important factor in forest cover change. Other reasons include the poor starting condition of the forest, economic incentives for conservation (whether harvesting forest products or maintaining habitat for safaris), or being in a remote area. In terms of deforestation, as Robinson et al. (2011) point out, communal settings face land use pressures just like any other form of land tenure, the tenure regime does not exempt them. However, tenure – or lack of agreed tenure clarity – seems to play a role in Cameroon and Burkina Faso where there is friction between overlapping customary and statutory systems.

A significant stream of international literature enters into the debate about the forest conservation effectiveness of protected areas, comparing protection regimes with other tenure regimes. Several authors, including Porter-Bolland et al. (2011), Persha et al. (2011), and Hayes (2006), address this question of whether the tenure regimes of protected forests or non-protected (multi-use) forests are more successful in conserving forests. Based on an analysis of data from 163 IFRI forests,

Hayes finds that legally designated protected areas are not more effective at protecting forest vegetation density than other institutional arrangements.

More recently, based on a meta-analysis of published case studies, Porter-Bolland et al. (2011) investigated the hypothesis that on a pan-tropical scale, rates of deforestation within or around community-managed forests are either equal to or less than forests under strict protection. As with Robinson et al. (2011), these authors found that deforestation occurred across the tenure regimes – in this case grouped into protected areas and community managed forests.

In contrast to the assessment of the literature by Robinson et al., Porter-Bolland et al. found that high deforestation rates were more prominent for protected areas than for community-managed forests.¹⁰ This led them to conclude that community managed forests may be at least as, if not more, effective in reducing deforestation as protected areas at the pan tropical scale. Not only did they find that community managed forests had lower annual deforestation rates; they also found that these rates were less variable than those reported for protected areas. The finding that protected areas are not always successful at avoiding deforestation concurs with other research on this topic, including Nagendra (2008) and Naughton-Treves et al. (2005).

However, Porter-Bolland et al. caution that while this is the composite picture on the very wide scale of the tropics, it cannot be generalized to the more limited scale

of individual cases. Some community managed forests in their sample showed deforestation rates similar to those in protected areas. They suggest that this is because deforestation results from multiple interacting factors that combine to produce specific outcomes in specific places. In this sense, tenure is only one of several factors affecting forest management and use practices.

However, the study authors observed that deforestation pressures do not necessarily result in forest clearing, as there are cases where institutional arrangements may overcome those pressures. Their results indicate that ten of the thirteen cases of community-managed forests with effective forest conservation achieved this in the face of various deforestation pressures such as infrastructure development, population growth, agricultural expansion, etc. The authors cite the example of a community management tenure regime in Mexico in which deforestation drivers do not necessarily result in increased annual deforestation rates mostly because communities have working rules for managing forested areas (Dalle et al. 2006, Ellis and Porter-Bolland 2008). This example, the authors suggest, shows that governance practices play a crucial role that is visible at the landscape scale. This finding is also suggested by Hayes (2006), who concludes that there are no statistically significant differences in forest conditions between legally protected forests and forests governed by users who establish and recognize forest rules. This is an issue we will be returning to later.

¹⁰ The data sets are not comparable however, because Porter-Bolland et al (2011) looks only at case studies from tropical forests.

In summary then, the consensus of the literature overviewed is that there is not a significant relationship between the tenure regime and forest conservation. This vast and rich literature, which we have only skimmed in this overview, shows that communities can be good forest managers in some cases but that community forestry and other forms of devolution are not a panacea for obtaining improvements in livelihoods and forest conservation (Ostrom and Nagendra 2006). Both improvements in forest condition and deforestation can be found across tenure regimes. At a global resolution, neither community forestry, nor regimes specifically oriented towards forest protection, have a statistically significant relationship to improved forest condition.

However, Coleman (2009) cautions that these results do not suggest that the tenure regime is never important. In particular instances, for particular forests, certain regimes may be better adapted to local conditions than others. He writes that, the point is to move beyond blueprint thinking such as that one particular tenure regime is always best – whether that be community managed, protected area or otherwise. Rather, we should focus on the specific management needs of specific forests -- a point Ostrom and Nagendra 2006 also made. The following paragraphs outline two factors that the literature overviewed indicates to be more important causal factors than the tenure regime (with the usual disclaimers about contextualizing): tenure security and local rule-making.

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Globally, tenure security (including aspects of monitoring and enforcement) is significantly related to improved forest condition.

Tenure security, as defined by Robinson et al. (2011) is the expectation that the norms governing the bundle of rights that constitutes tenure will be enforced. The writings of Broegaard (2005) on this issue have been influential. She argues that the factor that is relevant for decision-making is perceptions (in this case, of farmers) about the security of tenure. She writes that “perceived tenure security is defined as a composite concept combining the farmers’ own assessment of their tenure situation when asked directly, and their fears (or absence of fear) for future conflicts regarding their property rights. It is assumed that farmers’ assessment of their tenure security level will be influenced by their subjective understanding of their legal tenure situation, their general expectations regarding government enforcement and equality of the law, as well as their assessment of their access to the government institutions they might need in case of a land conflict.”

This issue of security is one that several authors have highlighted as successful in contributing to improvement in forest condition. I have grouped the studies looking at monitoring and sanctioning, as well as those on enforcement, together under the heading of tenure security, as they are conditions fitting the definitions above. These findings result from both of meta-analyses of existing case studies (for example, Pagdee et al. 2006, Robinson et al. 2011) as well as international comparison of forest data from the IFRI (Gibson et al. 2005, Chhatre and Agarwal 2008, Coleman 2009). These findings are briefly summarized here.

Analysing data from forests in twelve different countries, Gibson et al. (2005) sought to identify what factors associated

with successful resource management (i.e. leading to better forest conditions) at the local level are necessary and what are just important.¹¹ They concluded that rule enforcement must be present for successful outcomes on the landscape. According to these authors, rule enforcement by the local user group is significantly correlated to forest condition whether or not user groups are formally organized, dependent on the forest for a series of resources, or possess social capital. Further, Gibson et al. found this to be true in government-owned forests as well as in community-owned or co-managed forests.

A later study by Chhatre and Agarwal (2008), which looks into how local enforcement is related to changes in the condition of forest commons, concurs with these findings. Their statistical analysis of data on forest commons from nine (152 cases) countries confirms that better local enforcement is associated with a higher probability of forest regeneration¹². More specifically, Chhatre and Agarwal's analysis shows that higher levels of local enforcement are closely associated with increases in the predicted probability of regeneration and declines in the predicted probability of forest degradation across a variety of ecological and social contexts even when a number of other factors are taken into account. This study also takes into account additional variables, such as forest size, group size, collective action, and level of forest use and

FIGURE 4 | Effect of Collective Action and Enforcement on Forest Degradation or Regeneration

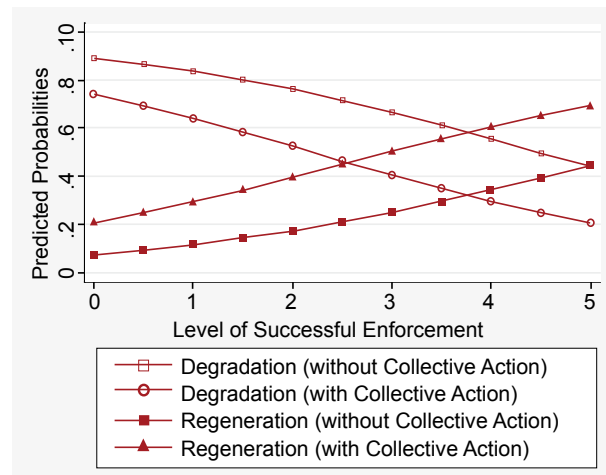


Fig.4. Relationship of level of enforcement with the predicted probability that a forest has degraded or regenerated, conditional on collective action around forest commons. Each curve represents the predicted probability with or without the presence of collective action around forests, holding all other variables at their median values. The level of successful enforcement (x axis) varies between 0 = no enforcement and 5 = strict enforcement.

Source: Chhatre and Agarwal 2008

dependence, to understand the effect of enforcement in different conditions. For example, Chhatre and Agarwal found that, controlling for other factors, larger forests are associated with low probability of regeneration and high probability of degradation. However, forests with high levels of enforcement are far more likely to have regenerated compared to those with no enforcement even for large sized forests, underscoring the importance of enforcement. With respect to the variable of collective action, Chhatre and Agarwal found that forests where local communities have undertaken collective action related to improvement

¹¹ These twelve countries are: Bolivia, Brazil, Ecuador, Guatemala, Honduras, Kenya, India, Mexico, Nepal, Tanzania, Uganda, and the United States

¹² These nine countries are: United States, Mexico, Guatemala, Bolivia, Uganda, Kenya, Tanzania, India, and Nepal.

activities (planting of saplings and clearing of debris and plant matter) are more likely to have regenerated. Furthermore, these variables seem to be mutually enforcing, as these forests respond better to increasing levels of enforcement - a forest with improvement activities has a more than 50% probability of regeneration at a medium level of enforcement, compared to a 25% probability for regeneration for forests without any improvement activities but the same level of enforcement. These results are illustrated in the diagram above.

Further empirical results on this issue are contributed by Coleman (2009) whose results show a highly consistent positive effect of monitoring and sanctioning on forest condition. Specifically, Coleman found that average forests with local users that monitor and sanction are much more likely to sustain Basal Area and the Shannon Diversity Index than forests without such users. In this study, the monitoring and sanctioning variable represents whether regular local monitoring occurs and whether sanctions, broadly defined, are imposed on rule breakers. However, this variable only indicates monitoring and sanctioning activities carried out by local user groups, not any activities that are carried out by external authorities. These results add an important element to the literature on forestry, common pool resource management, and human cooperation in general. Coleman concludes that the main lesson to be drawn from his study is not necessarily that local efforts to engage in monitoring and sanctioning are more effective than external efforts, but that local efforts certainly are effective.

The findings from these empirical comparative studies on the importance on tenure security are corroborated by publications that review and analyse existing literature. For example, a literature review by Pagdee et al. (2006) concluded that among the institutional variables identified as important, “effective enforcement” has one of the strongest associations with success in forest management.

The finding on the importance of security is highlighted by the literature review conducted by Robinson et al. (2011). They find that greater implied tenure security seems to improve the probability of positive forest outcomes. However, they caution (as do other authors cited here), that tenure security alone does not guarantee the preservation of forest cover. Even with secure tenure, negative cases are common, but positive outcomes occur significantly more often than negative ones. Moreover, when tenure is insecure, a negative forest outcome is significantly more likely than a positive one. Therefore, Robinson et al. conclude that tenure security seems to help keep forests intact.

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Globally, local rule-making is also significantly related to improved forest cover

The factor of local rule-making is closely related to tenure security and the monitoring and enforcement of rules. Indeed, some authors group these together in a single analysis. However, others have assessed this factor independently. This is worth looking at separately because rule-making is indeed a governance function distinct from rule

enforcement (according to the theory of separation of powers). The main empirical work on this issue is found in a publication by Persha et al. (2011), although this finding also comes up earlier in Ostrom and Nagendra (2006) and Hayes (2006), among others. These findings are briefly summarized in the following paragraphs.

The results of the study by Persha et al. (on the basis of data from 84 forests in 6 countries) indicate that forest systems are more likely to have sustainable outcomes (above average tree species richness and subsistence livelihoods) when local forest users participate in forest rulemaking.¹³ They found that the relationship is also significant in the opposite direction: unsustainable forest system outcomes are more likely when users do not participate in rulemaking. With respect to forest size, Persha et al. find that rule-making participation is associated with a lower probability of less desirable outcomes (unsustainable forest systems and those characterized by trade-offs) and a higher probability of sustainable forest system outcomes, across smaller and larger forests. These findings lead them to conclude that working toward formal participation of local forest users in rulemaking processes for use and management of forests from which they draw their livelihoods is an important way to increase the probability of obtaining more outcomes that are positive across social and ecological dimensions.

While further research would be needed to clarify the causal mechanism underlying this relationship between participation

in rulemaking and positive forest condition outcomes (as well as livelihood outcomes), Persha et al. suggest that rules that are locally constructed may be viewed as being more legitimate and better suited to local forest conditions.

Hayes (2006) also found a correlation between user-defined rules and, in this case, vegetation density in forests. Hayes concluded that across the tenure categories of parks and non-parks, the rules acknowledged and made by forest users that influence forest condition. In other words, the presence of forest product rules and the ability of users to make rules are both strongly correlated with vegetation density. For example of the 42 forests ranked as having below-average vegetation density, 13 forests (31%) have no product rules. In contrast, only four of the 41 forests ranked as having above-average vegetation density have no forest product rules. Furthermore, Hayes found that the importance of rules invoked by forest users is reinforced by the correlation between vegetation density and the ability of user groups to define forest rules. Forest vegetation density is sparser in forests where the users are unable to determine the forest rules and is higher in forests where they have rule-making responsibilities. For example, in those forests rated as having below-average vegetation density, not a single user group has rule-making responsibilities. In contrast, in 24 of the 43 forests considered to have above-average vegetation density, all user groups participate in forest rule making. However, Hayes cautions that broader

¹³ These six countries are: Kenya, Tanzania, Uganda, Bhutan, India and Nepal.

social and political processes and the existing legal frameworks at different levels may also interact in determining how local rules affect conservation outcomes.

The issue of local rules, in particular their perceived legitimacy by local forest users, is also addressed by Ostrom and Nagendra (2006). They write that if the formal rules limiting access and harvest levels are not known or considered legitimate by local resource users, substantial investment in fences and official guards to patrol boundaries are needed to prevent “illegal” harvesting. Without these expensive inputs, government-owned, “protected” forests may not be protected in practice. However, Ostrom and Nagendra also found that when the users themselves have a role in making local rules, or at least consider the rules legitimate, they are frequently willing to engage themselves in monitoring and sanctioning of uses considered illegal, even of public property. Thus, they argue that when users are genuinely engaged in decisions regarding rules that affect their use, the likelihood of users following the rules and monitoring others is much greater than when an authority simply imposes rules on users.

Concluding remarks

Following from the results of Ostrom and Nagendra (2006), the literature overviewed seems to indicate that we can consider that there is a significant relationship between who makes the rules, their perceived legitimacy, and the likelihood of their being followed and enforced – key components in tenure security. The overall finding of this literature overview is that positive forest cover change depends on the tenure regime’s bundle of rights including a significant space for local rule-making and local rule-enforcement. This means tenure regimes that are open to a significant amount of local autonomy so that the forest use arrangements can be adapted to local forest and social conditions. Thus, tenure is still important, just in a more locally adapted way than “blueprint” solutions that have been promoted by advocates of different tenure regimes. In response to the question of what tenure options are most likely to be effective for improving forest cover in what situations, Robinson et al. (2011)’s literature review concludes that: “in general, likely the most important is the hard work of strengthening legal and social institutions.”

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This bibliography is divided into three sections. The first includes several articles that review the international literature on this topic and the second includes global comparative studies. The third section is the main part of the bibliography which includes empirical case studies of the relationship between tenure regimes (and security) and forest cover change. These case studies have all been published in peer reviewed journals. The fourth shorter section covers additional case studies that are relevant but have not gone through the rigors of a peer review publication process. This section of the literature, which would include all the grey literature, is certainly vast. Several examples are included here, while more general studies about tenure and more theoretical works are not included.

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6.1 Literature review articles

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See also the publications at:

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