



## Comparison of the Forest Tenure in Brazil and China

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### Abstract

Brazil and China both have extensive forest areas in the world, making important contribution to reversal of the worldwide decline in forest. And as the world's leading importers and exporters of timber and timber-based products, sustainable forest management for both countries are crucial for global economy and environment, so there is an intense international interest in their sustainability and well-being. Tenure arrangements functioned as powerful tools of forest policy, is not only important for economic growth, social cohesion, poverty reduction and environmental protection - it is also essential for climate change mitigation.

This paper is to present and analyze the state of forest tenure in Brazil and China; then followed by a brief comparison of these two countries in terms of changing trends and reform impacts; Furthermore, it identifies some of the main challenges to the reform and points out several opportunities for extending the future forest tenure reform especially for mitigating climate change, and finally making a conclusion to widen the reach of local community tenure and to deepen the exercise of tenure rights.

**Key words:** Forest tenure; Forest-based communities and indigenous people; Sustainable forest management

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### INTRODUCTION

Forest tenure is a broad concept that includes ownership, tenancy, and other arrangements for the use of forests. Forest tenure is the combination of legally or customarily defined forest ownership rights and arrangements for the management and use of forest resources. Forest tenure determines who can use what resources, for how long, and under what conditions (Reeb & Romano, 2007).

There are many motivations for strengthening forest tenure, including reducing poverty, diminishing conflict, and improving forest management and investment. In addition, recent research suggests that the widespread problem of unclear forest property rights and associated weak local land-use governance is a key driver behind deforestation and degradation and must be addressed in order to effectively reduce deforestation and carbon emissions (UNDP, 2007; Timmons & Parks, 2007). Thus, climate change will exacerbate existing social tensions over forest land and may increase the rate and violence of conflicts.

Brazil and China both have extensive forest areas in the world, making important contribution to reversal of the worldwide decline in forest. And as the world's leading importers and exporters of timber and timber-based products, sustainable forest management for both countries are crucial for global economy and environment. During the past decades, forest tenure institutions in both countries have been varying with their dramatically changing social, economic, ecological, organizational, and political context. Privatization and community-based forest management have brought rapid changes

in forest ownership patterns and increasingly complex stakeholder relations. However, these recent changes in these two major forestry countries have not been adequately assessed. Therefore, this paper tries to provide an understanding the trends of tenure issues in Brazil and China, for academic researchers and policy-makers to promote sustainable use of forest resources and formulate adequate policies.

The paper is organized by the following four sections: firstly, it describes the historical trends and status of forest tenure in Brazil and China; then it is followed by a brief comparison of these two countries in terms of changing trends and reform impacts; in section 3, the paper discusses the challenges facing up in both countries during the devolving forest land tenure process and indentifies some opportunities for extending, improving the future forest tenure reform especially for mitigating climate change, and finally making a conclusion in section 4.

## 1. STATUS OF FOREST TENURE IN BRAZIL

Brazil is the largest country in South America, also the second most forest-rich country in the world and home to the largest surface area of tropical forest (FAO, 2006). Brazilian forests are broadly classified as Amazon rainforest, Atlantic rainforest, central cerrado savanna, arid caatinga, and the wetlands of Pantanal (ITTO, 2006). About 95% of the existing natural forests are located within the Amazon area.

Brazil's forest ownership and tenure system is complex. The Brazilian Constitution recognizes two types of property regimes- private and public. In summary, the private/ public ownership data on the country's natural (not planted) forest are not consistent in various papers, but it is estimated that approximately three-quarters of these forests are under the public domain (owned by the State) and one-fourth is privately-owned. Of the public forests, around one third is comprised of conservation areas and indigenous lands, and the remaining two-thirds are forests in military zones and forests that are not officially "claimed" (not declared a protected area or under de jure private ownership) and/or are disputed. Since 1988, when the current Constitution was drafted, indigenous groups have steadily gained greater and more secure access to forest resources.

Assessing the status of forest ownership and tenure in Brazil is complicated by the country's multiple property regimes. This is also complicated by non filed land claims settled by a large number of populations, including indigenous groups, traditional populations and land squatters. According to the official statistics (tropical forest tenure assessment), in 2002, 306.94 million hectares of Brazil's forest are under the public domain, which dropped to 114.18 million hectares in 2008. Of these, 77% are administered by the government and 13% are reserved

for local communities and indigenous peoples. And they estimate private ownership of forests to be 30% in 2002 and 73% in 2008. Domingos (2004) and Lentini et.al (2005), focusing on the Amazon region, reported that 24% of the land is privately-owned and 76% is public (of which 29% is under protected areas that include conservation areas and indigenous lands, and the remaining 47% is comprised of other types of public forests).

During the past 500-year old Brazilian agrarian history, changing land tenure policies resulted in a set of highly complex and overlapping private and public forest tenure regimes. Various forest stakeholders with diverse degrees of economic and political power- from peasant farmers to large scale private land development companies- have been continuously competing for the government to prioritize their vision of how the forests should be used. These "contested frontiers" involve additional power struggles between municipalities, states, the federal government, and different agencies within the federal and state governments (Schmink & Wood, 1992). On the one hand, the policies led to a concentration of private lands in the hands of the wealthy and in high rates of deforestation. On the other hand, the Brazilian government recently recognized small landowners, indigenous peoples, and rubber tappers' require of the land and forest recourses. Indigenous groups and "traditional peoples" have gained significant concession rights to forests through the creation of indigenous land, sustainable conservation areas, and agrarian reform sustainable-use projects. However, the majority of the rural population in the Amazon continues to not have title to land, nor secure ownership of rights to forest resources. It mainly because the land titling processes itself is highly bureaucratic and tends to take years to advance. And this is further complicated by FUNAI's internal division regarding the issue of indigenous lands, and by frequent changes in the agency's administration that have led to repeated modifications in FUNAI's official position and actions taken in relation to indigenous land titling processes (Ioris, 2005; Bauch et. al, 2009).

## 2. STATUS OF FOREST TENURE IN CHINA

According to information released by FAO in 2010, there were 206.86 million hectares of forest land in China, accounts for 4.5 percent of the world's total, and its wood volume accounts for 3.2 percent of the total. China has the greatest plantation area of any country in the world. With its varied and complicated natural, geographic and climatic conditions, it has a wide range of forest types and tree species, including tropical, subtropical rain and monsoon forests, temperate broadleaf, mixed and coniferous forests, oasis forests and desert forests. Forests cover 18.21 percent of the total land area (Lei, 2005). China is one of the world's largest timber and timber-based product trading countries (SFA, 2005).

There are basically two types of forestland ownership within China's forest sector: the State ownership and collective ownership. Collective forests account for 58 percent of China's forest land and can make a significant contribution to rural livelihoods. This fundamental institutional setting has not changed since late 1950s when China collectivized all land in rural areas. Administrative villages, usually comprised of a number of natural villages (or clusters of villager families), function as the legal owners of the collective forests in the majority cases of rural China (Xu & Jiang, 2009). Over the last 20 years, there has been a growing interest in empowering local communities, de-centralizing decision-making to local government units and getting private sector involvement in forest management. This interest has been paralleled by significant shifts in forest tenure and innovative institutional arrangements aimed at increasing local stakeholders' direct involvement in forest management.

As part of its land tenure reform policy and an extension of its Household Responsibility System (HRS) in agriculture sector, China has started the process of de-collectivizing and "privatizing" forest tenure since the early 1980s. This has opened the door for many stakeholders to participate in the management, protection and utilization of collective owned forests. In March 1981, the State Council issued its "Resolution on Issues Concerning Forest Protection and Development", also known as "Three Fixes" policy, which initiated a new phase in the development of forest tenure by shifting towards the goals of de-collectivization and decentralization of forest use and management. This marked a pattern of reinstating some degree of private ownership of forest rights, and concomitantly reduced the importance of collective rights in rural affairs. By 1986, nearly 70% of the collectively-owned forestland had been transferred to rural household management. However, HRS in China's forest sector has not had the same success it had in the agriculture sector then. Implementation of the three fixes policy was followed by vast destruction of collective forests (Liu, 2006) and furthermore in many regions the pace of forest tenure reform was also reined in.

Recently since early 2000s, the Chinese government kept promoting reform of the tenure system for collective forests, which focuses on devolving land-use rights and forest ownership in collective forest areas to individual households, collections of households (so-called "partnership"), and private contractors; alternatively, they

may remain collective management either at the level of hamlets (so-called village clusters or natural villages) or at the full community level. Although the reform maintained collective ownership of the land, it does offer a stronger possibility of transferring the long-term rights households have to the forest, including the right to transfer and mortgage (Xu et.al, 2010). In sum, the reform is widely seen as another important step toward increasing the private ownership of the land allocated to individual households. The current forest tenure reform will allocate 167 million ha of forest land to households, and about 500 million farmers are expected to benefit. Some 35 percent of total collective forests have already been transferred to individual households.

### 3. COMPARISON AND DISCUSSION

Table 1 below compares forest tenure data for 2002 and 2008 in Brazil and China, using Tropical Forest Tenure Assessment and FAO Global Forest Resources Assessment 2010 as the source of data. Also, Table 1 distinguishes between the public and private domain of forest lands and further subdivided them into two categories, yielding four tenure categories in total: Public ownership- Government administered and reserved for communities & indigenous peoples; Private ownership-owned by communities & indigenous peoples and owned by individuals & firms. Unlike Brazil, the forests in China are owned by public government and collective communities, none of them belong to private individuals.

The results show that the absolute area of public forest land administered by government in Brazil has decreased by 70%, while China's public forest grew slightly, almost remains the same. And within the public forest in Brazil, the forest designated for use by communities and indigenous peoples increase more than twice; as to the private forest sector, the absolute area of communities and indigenous peoples in both countries has enhanced, but the increase rate of Brazil is faster than that of China. During the past years, Brazil issued much more private property right to individuals and firms, with an increase of 71%. In sum, the forestry land area managed by the individuals, communities and corporations is gradually extended. Comparing with China, Brazil has experienced a dramatic land ownership shift out of the public domain and into the hands of communities and private individuals and firms.

**Table 1**  
**Forest Tenure Distribution in Brazil and China**

Country	Public				Private			
	Government administered		Reserved for communities & indigenous peoples		Owned by communities & indigenous peoples		Owned by individuals & firms	
	2002	2008	2002	2008	2002	2008	2002	2008
<b>Brazil</b>	295.26	88.56	11.68	25.62	74.50	109.13	57.30	198.00
<b>China</b>	76.06	77.00	--	--	103.50	119.52	--	--

Note: All figures expressed in million hectares (Mha); numbers have been rounded.

There are several important considerations to make that may explain some of the forest tenure transition in Brazil. Firstly, decrease in forest land administered by governments might be explained by decrease in the total forest area of Brazil due to deforestation or differences in inventory techniques; additionally, almost half of the Amazon's forest is essentially unprotected "empty land"-nominally federal property. Under the Brazilian law, anyone who occupies and cultivates a piece of land for a year and a day becomes a *posseiro*, and untitled occupant who acquires physical but not legal possession of the land. *Posseiros* can gain clear title of the land after five years of continuous physical occupation and registration of his/her claim with the local town clerk. This law potentially results in a drop in Brazilian public forest and increase in the private forests.

And there are some similarities in both countries. With respect to the way impelling the reform, both Brazil and China employed conventional top-down, coercive government approach. And they both implemented national policy and legislations to give indigenous peoples, communities and households stronger rights to forests. For example, Brazil's 2007 Law on Public Forest Management permits the allocation of forest concessions to communities and gives special attention to the recognition of and respect for local communities' rights to forest. And China has developed holistic and integrated forest legislation (Liu, 2006). Take the recent round of tenure reform in for instance, the new national policy was officially issued by the Central Committee of the Communist Party of China and the State Council on July 14<sup>th</sup>, 2008 and is entitled "Guidelines on Fully Promoting Collective Forest Tenure System Reform." The government has also financed the delimitation, surveying, titling and registration of the new plots, investing approximately US\$ 370 million in 2008 alone for these tasks (Xu et.al, 2010).

However, there are also a few differences are due to variations in socio-cultural and political conditions. The recent forest tenure reform in China was in effect more of a verification and consolidation of existing distributions of land rights rather than a new and wholesale redistribution in Brazil. Furthermore, since these two countries have different political institution and regime. Politics of Brazil takes place in a framework of a federal presidential representative democratic republic, whereby the President of Brazil is both head of state and head of government, and of a multi-party system. On the contrary, China is a one-party state that has been ruled by the Chinese Communist Party (CCP) since 1949. Thus, "contested frontiers" (Schmick & Wood, 1992) involve additional power struggles between parties and different agencies within the federal and state governments, which lead to overlapping authority over the same area of land and policies that are mutually incompatible, making problems worse. One more thing

unlike China, forest ownership and tenure in Brazil, particularly in Amazon, has been impacted by colonial history. In the colonial period, extensive estates were created through the implementation of a system of *sesmarias*, cutting across and incorporated large territories historically occupied by indigenous groups (Diegues, 2000). This marked the commoditization of land in Brazil, effectively legitimizing those who had the means to buy land as *de jure* landowners, at the expense and exclusion of the majority of the rural population. And it has further pitted indigenous populations, colonists and international industry against each other.

## 4. IMPACTS OF FOREST TENURE REFORM

Since the forest tenure reform is still an on-going and complex thing, it is hard to assess the impact of tenure reform outcomes by exact scientific evidence. Nevertheless, there is general agreement in the development community that secure property rights are central to achieving social, economic and environmental goals. Rather than compile a pile of research literature, I hereby provide some illustrative findings.

### 4.1 Environmental Impacts

Many studies have found that strengthening forest tenure security can result in improved management and conservation of forests. For example, in Brazilian Amazon, the indigenous reserves tend to inhibit deforestation and lower rates of forest fires, which are publicly recognized as a leading bulwark against deforestation even compared to national parks (Nepstad et. al, 2006). And Araujo et.al (2009) provided significant econometric evidence that insecure property rights have a positive impact on deforestation in Brazil. And according to China's survey, reforestation has been increased by an average of almost 10% across the provinces undergoing reform between 2000 and 2006.

### 4.2 Economic Impacts

Recent studies in Brazil and China show that strong formal forest tenure rights can improve the income of beneficiaries. In Amazonas, the state government has prioritized forest management activities and the forestry industry. It is anticipated that populations living in the forests will be given more opportunities to benefit from these recent changes. Research in China concludes that forest tenure change led to increased farmers' revenue from forests, including timber harvests (Xu et. al, 2010).

### 4.3 Social Impacts

With a lack a clearly-defined demarcations, land registers, colonists, public agencies, indigenous people and big investor vie for access and control of forest, which resulted in higher social conflicts and large deforestation.

Clarifying tenure rights would protect indigenous people against the encroachment of outside loggers and squatters and harmonize their relationship with those big companies, just as we saw in Jari. Additionally, besides the top-down path of national and international policy measures, forest tenure reform enabled the communities involved in sustainable management of forest from the grass-roots level upward. For instance, in China reallocation of rights has to be approved by either a village representative committee or a village assembly with a two-thirds vote. So it provides the opportunity and respect for local collective choice and participation, which usually diminishes conflicts and leads to more social justice and human right.

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## 5. CHALLENGES AND FUTURE OPPORTUNITY IN CLIMATE CHANGE MITIGATION

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The progress in expanding the geographic extent of community and household tenure must be tempered with the understanding that the expansion of area under legal ownership of communities and individuals forms does not necessarily guarantee a complete bundle of rights to forests as defined by the property rights paradigm. Efforts to strengthen local forest tenure have been slowed or threatened by the failure of coordination among branches of government, budget constraints, lack of expertise and problematic content of policies for both Brazil and China. Thus, forest tenure reforms require significant institutional and capacity-building efforts. In addition, many forest-based communities do not have access to health services, education and infrastructures. There are also many non-tenure rights and accountability mechanisms that are essential for forest-based peoples' wellbeing and for the conditions and incentives to be in place for forests to be sustainably managed. If forest tenure reform simply allows communities increase access to the forest resource rather than providing basic infrastructural service, financial and technical assistance and income-generating projects, it is highly possible the local populations would turn to predatory activities consequently, such as cattle and illegal logging. Moreover, it is also likely that with greater market integration there will be a consolidation of small farm holdings, more contract farming, and an exit of marginal producers to other pursuits. There is a high risk that the more powerful actors at the local level are controlling land allocations and more farmers losing their land, which would result in disproportionately benefiting and deepen social inequity. Finally, growing populations in rural across the developing world including Brazil and China increases the scale of many of these challenges. The declined farm size, increasing food and energy demand and rise in landlessness, would thereby increase pressure on forests and the tenure regimes that protect them.

However, though facing up challenges, forest tenure reform did bring about some positive impacts and a promising direction for global forest sector, especially under climate change and forest carbon sequestration. Recent research suggests that the widespread problem of unclear forest property rights and associated weak local land-use governance is a key driver behind deforestation and forest degradation (Eliash, 2008). Only when forest ownership rights and clear tenure regime are secure, on paper and in practice, do longer-term investments in sustainable management become worthwhile. Thus, these owners can participate in and potentially be compensated by climate mitigation programs. The leading approach for involving forest management in carbon sequestration, called REDD, which establishes a system of compensation that is financed either through carbon trading or through international conservation funds. Many researches on REDD options suggest that forest communities and individuals with forest ownership rights have more bargaining power, and they also point out strengthening tenure and getting local involvement to could ensure forest dependent peoples benefit, and mitigate existing economic disparities (Griffiths, 2007).

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## CONCLUSION

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Forest tenure does not mean ownership of forests, but it means property rights arrangements for different attributes of forest ecosystems. Optimal forest tenure is an optimal mix of private and public rights and duties with respect to different attributes of forest ecosystems, and this optimal mix will vary with social, economic, ecological, organizational, and political context (Kant, 2000). Clear, secure, and diversified forest tenure systems are a fundamental requirement for sustainable forest management and for improving the role of forests in poverty alleviation through sustainable use of forest products.

In this context, China and Brazil's recent forest tenure reforms, along with other changes in developed countries and transition economies have provided important empirical case studies with useful implications for global attempts to reduce forest emissions and decrease forest-based poverty and conflict. The different tenure arrangements associated with forest land and forests, and their dynamic nature, are widely accepted to have profound impacts on farmers' behavior and social welfare.

So far, there is no empirical evidence in support of any specific form of tenure or paradigm for the whole world. Additionally, the question of exactly how tenure affects forest management and farmers' livelihoods remains a topic of hot debate. There is therefore a great need to improve understanding of the forest dependent communities' expectation and the implications of forest tenure, stimulate national and international debate on the subject, and require more active engagement by the wide

range of stakeholders in forest right issues- governments, private companies, donor organizations, NGOs, members of wider civil society and of course research institutions by providing scientific evidence in future long-term research.

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