Forest Policy and Economics 70 (2016) 67–79

Contents lists available at ScienceDirect

Forest Policy and Economics

journal homepage: www.elsevier.com/locate/forpol

REDD + implementation in the Ecuadorian Amazon: Why land configuration and common-pool resources management matter

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ARTICLE INFO

Article history:
Received 6 January 2016
Received in revised form 17 May 2016
Accepted 18 May 2016
Available online xxxx

Keywords:
CPMRs
Yasuní
Amazon
Indigenous peoples
Redd +
Forest governance

ABSTRACT

Community-based forest management under REDD + has been suggested as a promising mechanism to conserve forests and at the same time enhance living conditions of their inhabitants. In the buffer zone of the Yasuní National Park in Ecuador, we analyzed the spatial and institutional configuration of Common Property Management Regimes (CPMRs) of two indigenous groups (Shuar, Kichwa) and a group of Colonist cooperatives in their historical development. We used the Ostrom (1990) principles to assess land configuration and institutional arrangements for decision-making in the use of shared resources and analyzed the implications for REDD + implementation.

We found that CPMRs of the two studied indigenous groups are becoming increasingly similar to those of the Colonists as a result of agrarian reforms and legal frameworks for communal organization. The informal continuation of traditional forms of organization under (modern) formal structures and the overlap of *de jure* and *de facto* rights hinder efficient and transparent forest governance and REDD + implementation. Spatial and institutional homogenization of CPMRs of various ethnic groups and privatization of farms inside CPMRs causes further forest fragmentation and impedes conservation goals.

1. Introduction

Deforestation and degradation of tropical rainforests affect the global and regional climate and can have serious impacts on livelihoods in developing countries (Wunder et al., 2014). To counteract these negative effects and enhance forest carbon stocks in developing countries, Reducing Emissions from Deforestation and Forest Degradation (REDD+) was introduced at the 11th session of the Conference of the Parties (COP 11) to the United Nations Framework Convention on Climate Change (UNFCCC), November 2005 in Montreal, Canada. REDD + is a mechanism that provides financial incentives to conserve and sustainably manage forests. However, it is not clear under which conditions REDD + can become a real opportunity to protect large community-managed lands.

This paper provides ground-based data that enrich the scientific debate on trade-offs of REDD + implementation through an analysis of the spatial and institutional dimensions of communal arrangements. Community-based forest management has been suggested as an appropriate approach to involve the local population in natural resource management and forest conservation. It was also considered to bring efficiency, efficacy and equity to REDD + (Agrawal and Angelsen, 2009) and had the additional advantage of lower transaction costs in the REDD + implementation process (Chhatre et al., 2012). Moreover, large forest areas under autonomous governance in community lands are associated with high carbon pools, ownership and long-term sustainability (Pretty, 2003; Bremner and Lu, 2006; Chhatre and Agrawal, 2009; Porter-Bolland et al., 2012).

Apart from financial revenues, the participation of Indigenous Peoples (IPs) in REDD + projects can enhance their actual living conditions by providing non-carbon benefits like food security, diversification of income, land tenure rights and the reinforcement of local community organizations (Lawlor et al., 2013; Chhatre et al., 2012). However, there is still uncertainty on how REDD + could be implemented without damaging traditional Common Property Management Regimes (CPMRs) (Bluffstone et al., 2013). Restrictions to forest use and governmental control associated with REDD + can endanger the livelihoods of forest dwellers (Bluffstone et al., 2013). To avoid this, it is crucial to have a profound knowledge regarding customary management of land and resources especially in rich and complex cultural and biological environments. Only then REDD +

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http://dx.doi.org/10.1016/j.forpol.2016.05.016
1389-9341/

and other conservation strategies can provide sufficient protection for local inhabitants and enhance forest conservation. Furthermore, we argue that not only existing knowledge but also the revalorization of traditional practices of community forest management can provide critical achievements to REDD + initiatives.

Moving from the 'tragedy of the commons' in open-access land resources (Hardin, 1968), Ostrom (1990) proposed eight principles for the design of CPMRs. These principles are related to boundaries, rules, collective choice arrangements, monitoring, sanctions, conflict resolution, institutional recognition and networks. These widely used principles characterize how successful and stable institutions for the sustainable governance of common-pool resources (CPRs) should look like. According to Schlager and Ostrom (1992), CPMRs' rights are conceptualized as operational rights (access and withdraw rights) and collective choice decisions (including management, exclusion and alienation rights). In this context, clear rights and responsibilities with regard to CPRs are essential for the effective management of CPMRs. Rights can have a legal recognition (*de jure* rights) or the users/local organizations can state and implement customary rights by themselves (*de facto* rights). However, these two types of rights can overlap and may cause legal uncertainties and conflicts (Schlager and Ostrom, 1992; Bremner and Lu, 2006).

Besides clear ownership arrangements and control over territories, social capital plays a major role to ensure conservation compliance. In CPMRs, social capital encompasses trust, reciprocity, common rules, networking and locally enforced incentives and sanctions (Ostrom, 1990; Agrawal, 2001; Dietz et al., 2003; Bremner and Lu, 2006). However, the ability to organize is not uniform among all groups and inappropriately planned management of forests in indigenous lands can lead to monopolization of resources by elites (Nagendra and Ostrom, 2012; Krause et al., 2013). Therefore, it is important that multi-scale governmental policies and plans interact with CPMRs (Ostrom and Nagendra, 2006; Nagendra and Ostrom, 2012).

Insecure land tenure and inappropriate participation mechanisms as well as the lack of clear rules and rights for natural resources management can have negative impacts on the livelihoods of the local population and also become obstacles for successful REDD + implementation (Chhatre et al., 2012). To guarantee full and effective participation in REDD +, the UNFCCC (2011) dictates the "respect for the knowledge and rights of IPs and members of local communities".

Despite its importance, little attention has been given to CPMRs and local decision-making institutions for resource use especially in the Amazon region (Richards, 1997; Bremner and Lu, 2006). This is reflected by only few studies that deal with CPMRs in Amazonian countries, such as those by Richards (1997); Lu (2001); Bremner and Lu (2006) and Oldekop et al. (2013) in Ecuador, Becker and León (2000) in Bolivia, Chase Smith (2000) in Brazil and Peru, and Giudice and Yu (2009) in Peru. Especially for countries like Ecuador, where IPs' territories represent 60% of the country's forests, which in turn store almost 80% of the biomass carbon, CPMRs are of utmost importance (Bertzky et al., 2010; Lopez et al., 2013).

This article provides important ground data that contribute to the practical design of REDD + in community-managed lands. It is is based on an assessment of land configuration and institutional arrangements for decision-making in the use of shared resources.

Our results are presented in two parts: First we conduct a spatio-temporal analysis of the dynamics of land configuration to better understand the historical and cultural context of current land and resources distribution and management practices. Using the theoretical framework of CPMRs by Ostrom (1990) and followers, we then characterize CPMRs based on institutional arrangements for decision-making of shared resources and explore resource use rules and management of CPMRs. Hereafter we analyze *de jure* versus *de facto* rights of CPRs' principles comparing the three study groups. Finally we discuss the implications of customary and actual land configuration and traditional institutional arrangements for REDD + implementation.

2. Methodological approach

2.1. Analytical framework

Our study is based on a spatial-temporal analysis of land configuration as well the principles on sustainable management of Common Property Management Regimes (CPMRs) developed by Ostrom (1990) and subsequent amendments by Schlager and Ostrom (1992); Agrawal (2001) and Dietz et al. (2003). There is empirical evidence that these principles can serve as a good basis to analyze CPMRs with respect to institutional arrangements for decision-making and social capital as well as resource use rules and management of CPMRs (Cox et al., 2010). Following Richards (1997) and Bremner and Lu (2006), we construe CPMRs as collective ownership arrangements where holders regulate the access and use of Common Property Resources (CPRs) and limit access to non-owners. In this context, the terms CPMRs, commune, community, and center are frequently used interchangeably. Apart from these aspects, we assume that the principles for the effective management of CPRs can also guide the design of REDD + based on CPMRs, as the REDD + mechanism should build on the existing regimes. Considering the cultural and organizational differences between the three study groups (Shuar, Kichwa, Colonists), it is moreover important to differentiate between *de facto* and *de jure* rights of common resources use and management.

2.2. Study area

The study area is located in the Orellana province within the Yasuní Biosphere Reserve (YBR) in the northeastern Amazon basin of Ecuador. The YBR covers an area of 23,662 km^2 (FOES-REGAL, 2008; Fig. 1). The core area encompasses the Yasuní National Park (located between the Nashiño and Yasuní Rivers), the Waorani Ethnic Reserve and the Untouchable Zone of the isolated tribes of the Tagaeri and Taromenane groups (ZITT). The buffer area stretches along the Napo River and the Yuca and Auca roads (Finer et al., 2009). The YBR is part of a larger tropical rain forest area with average annual temperatures of 25 °C and average annual precipitation of 3000 mm (FOES-REGAL, 2008). This highly biodiverse ecosystem contains important aboveground carbon reservoirs (*circa* 111–160 tons/ha) (Bertzky et al., 2010). Indigenous Peoples' territories represent 50% of the YBR; however, not all of them have legal recognition. For example, in the Orellana province only 12.9% of the Kichwa, 23.1% of the Shuar and 54.2% of the Colonists who live there have recognized land tenure (FOES-REGAL, 2008).

The Ecuadorian Northeastern Amazon region has experienced fast population growth since the 1970s, when the construction of roads for oil exploration started. Along with the agrarian reforms in 1964 and 1972, the state government awarded farms (*fincas*) of 50 ha to enhance the colonization of the Amazon region (Pan et al., 2004; Proyecto Bosques, 2009). After Colonists settled in the region, they were able to gain the land titles if at least 50% of the terrain was cleared (Richards, 1997; Perreault, 2001). The government, clerics, and some indigenous leaders stimulated IPs to form farmers' cooperatives as a (cheaper) possibility to obtain land prior to the legal constitution of indigenous communities (Erazo, 2011). This triggered an unplanned colonization process accompanied by large-scale deforestation, which is still ongoing and among the highest in Latin America (Pichon, 1997; Zapata-Ríos et al., 2006; Finer et al., 2009). Increasing immigration and high fertility rates of the local population increase the demand for land and cause further landscape fragmentation (Barbieri et al., 2005; Morales et al., 2010). Off-farm income, shifting agriculture, livestock production, hunting and fishing are main subsistence activities for local inhabitants (Loaiza et al., 2015). Indigenous communities living in the YBR are adapting to market economies and live in "accelerated cultural fragmentation and homogenization" (Perreault, 2001).