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Meanings, drivers, and motivations for community-based conservation in Latin America

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ABSTRACT. Indigenous and rural communities have developed strategies aimed at supporting their livelihoods and protecting biodiversity. Motivational factors underlying these local conservation strategies, however, are still a largely neglected topic. We aimed to enrich the conceptualization of community-based conservation by exploring trigger events and motivations that induce local people to be engaged in practical institutional arrangements for successful natural resource management and biodiversity conservation. By examining the history and development of three community conservation initiatives in Brazil, Mexico, and Bolivia, we have illustrated and discussed two main ways of understanding community-based conservation from the interaction between extrinsic and intrinsic motivations. First, incentive-based conservation policies can stimulate people's economic interests and mobilize individual and collective behavior toward the formalization of conservation-oriented actions. Second, environmental justice concerns, such as international and national movements for the recognition of indigenous peoples' rights, can support local people's sense of autonomy and result in increased control over their territory and resources, as well as a renewed conservation commitment. The results are useful from a policy perspective because they provide insight into the governance of conservation development by bridging the gap between communities' culturally based motivations for conservation, which are still embedded in customary institutions, and broader political and socioeconomic contexts.

Key Words: *biodiversity; commons; governance; Latin America; protected areas*

INTRODUCTION

Since the 1980s, global environmental conservation policies and discourses have been increasingly influenced, either rhetorically or practically, by the idea that conservation demands the coexistence of humans and nature (Adams et al. 2004, Wells and McShane 2004). Involving communities in decision making related to natural resource management has been praised as a potentially fruitful endeavor that can enhance local well-being while protecting biodiversity and ecosystem functions (United Nations 1992, Schwartzman et al. 2000, Adams and Hutton 2007, Berkes 2007, UNEP 2007). Although community-driven and participatory conservation approaches can in some instances be ineffective in improving conservation and local livelihoods (Terborgh 1999, Agarwal 2001, Berkes 2004), evidence from community-managed forests across the tropics, including indigenous reserves, extractive reserves, and joint forest management, show that overall such initiatives can be more effective in deterring deforestation than government-managed protected areas (Porter-Bolland et al. 2012, see also Gaveau et al. 2009, Andam et al. 2010, Nelson and Chomitz 2011).

Environmental effectiveness debates aside, researchers have found it challenging to provide a precise definition of community-based conservation because it has been used to refer to a myriad of initiatives with different aims, governance systems, degrees of local decision-making power, and incentives to encourage communities' participation for conservation purposes (Ruiz-Mallén and Corbera 2013). Western and Wright's (1994:7) seminal definition states that community-based conservation "includes natural resources or biodiversity protection by, for, and with the local community." These authors also highlight that the

core of the concept is "the coexistence of people and nature," which is "distinct from protectionism and the segregation of people and nature" (Western and Wright 1994:8). Thus, community-based conservation has been broadly defined as a wide range of natural resource management practices improving conditions for the coexistence between humans and nature (Berkes 2007). We argue, however, that community-based conservation can be approached in two broad ways depending on the kind of institutional arrangements underpinning conservation activities and their expected outcomes.

The first approach concerns people-centered conservation, which aims at reconciling the goals of conservation and development by establishing partnerships between local communities and external organizations, i.e., government organizations, private organizations, and nongovernmental organizations (NGOs). These partnerships intend to increase the economic and other benefits that local people get from becoming involved in resource protection. This approach encompasses formalized conservation initiatives motivated by national or international policies and programs that aim to reward communities for environmental stewardship and encourage them to engage with the emerging conservation industry (Wainwright and Wehrmeyer 1998). Examples of these include comanagement initiatives in buffer zones of protected areas or sensitive ecosystems (Moller et al. 2004, Armitage 2009, Dowsley 2009), ecotourism projects and community-based reserves (Ohl-Schacherer et al. 2008, Stronza and Gordillo 2008, Martin et al. 2011), and more recently, payments for ecosystem services (PES) schemes (Jack et al. 2007, Muradian et al. 2010). However, according to some critical views, such participatory management for conservation can only be

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considered community-based conservation when it places “the community’s involvement at the center of conservation, rather than the mechanism (e.g., a park, project, or land use zoning) to achieving it” (Campbell and Vainio-Mattila 2003:421). Critics of this approach also highlight that many of these projects have contributed to undermining rather than empowering community actors despite the accompanying mantra of participation and resource management decentralization (Little 1994, Lele et al. 2010, Schultz et al. 2011). It has also been argued that some of these initiatives represent “enterprise-based conservation” (Berkes 2007) because they focus on increasing the local economic returns from conservation and the development of conservation-compatible activities in biodiversity-rich areas, which can be problematic in different ways. For example, initiatives promoting ecotourism, safari hunting, participatory forest management, and the sale of nontimber forest products can lead to the commodification of nature by community members and can exacerbate existing socioeconomic inequalities (King and Stewart 1996, Marshall et al. 2006). More recently, the trend toward the monetization of ecosystem services has also generated problems leading local people to change their original idea of sustainable use of natural resources to another idea that uncritically supports the “fortress conservation” paradigm (Reyes-Garcia et al. 2013). This is also generating new ecological and distributional conflicts at the local level (Corbera et al. 2009).

The second approach to community-based conservation relies on the existence of time-tested community-based management practices based on customary arrangements that have resulted in biodiversity protection (Heckenberger et al. 2003, McNeely and Scherr 2003, Toledo et al. 2003, Berkes 2004, Berkes and Davidson-Hunt 2006, Robson 2007). It emphasizes community-based conservation as a range of livelihood-supporting, natural resource management strategies that through long and adaptive processes of trial and error and collective learning have led to sustainable and resilient ecosystems (Posey 1992, Folke et al. 2005, Maffi 2005, Berkes 2009). However, critiques of this approach argue that the contribution of these practices to enhancing biodiversity might differ depending on how conservation is defined, e.g., if the measure of success is avoiding forest loss, or if it instead takes into account biological diversity across the reference landscape regardless of changes in forest cover (Berkes and Turner 2006). Another concern is whether, even if conservation occurs, this is indeed the result of an intentional action rather than a result of low demographic and market pressures or unsophisticated technologies. This question is not trivial, because lack of intentionality may mean that conservation outcomes can vanish as soon as the overarching context changes. To ensure long-term conservation outcomes from such traditional management practices, local conservation practices and initiatives are increasingly subjected to processes of formalization worldwide. For instance, some of these community-guided efforts have started to receive official recognition, as conservation areas and initiatives, under comanagement schemes or the new International Union for Conservation of Nature category of Indigenous Peoples and Community Conserved Areas and Territories.

Given that communities are “embedded in larger systems and they respond to pressures and incentives” (Berkes 2004:628), it becomes important to ask why local people engage in

conservation so that we can improve our understanding of the concept and practice of community-based conservation. We explore three community conservation initiatives in Latin American tropical forests focusing on the external drivers and individual and collective motivations that have led local people either to engage with external organizations in conservation initiatives or to maintain their traditional natural resource management and conservation practices for subsistence purposes. As a result, we discuss two main ways of conceptualizing community-based conservation linked to conservation incentives and environmental justice motivations and their implications for deterring deforestation and enhancing local livelihoods.

DRIVERS AND MOTIVATIONS FOR COMMUNITY-BASED CONSERVATION

Community-based conservation cannot be properly conceived without understanding the nested interactions between external and internal motivators triggering conservation (Souto et al. 2014), which we refer to as drivers and motivations, respectively. Drivers include contextual conditions and diverse institutional processes, from the global to the local scale, that provide incentives, pressures or sanctions, and enabling conditions to local people for participating in conservation (ESPA-AA 2008). Motivations include targets existing within the individual or group, and, consequently, at the local scale, that incite human behavior and actions for being engaged in conservation (Ryan and Deci 2000). The complexity of such interactions relies on the fact that triggering events and the social-ecological context influence people’s individual and collective environmental behavior.

Triggers of local people’s engagement in both conservation projects and traditional management practices can consist of contextual conditions of a different nature and external to the communities, such as environmental degradation and situations of conflicts and disasters (Seixas and Davy 2008). State interventions such as the devolution of property rights to local communities have also been found to be an important driver of these initiatives (ESPA-AA 2008). Drivers can also include financial mechanisms and policy instruments to enhance community-based conservation. For instance, new market opportunities related to performing conservation activities can provide communities with economic incentives to guarantee the provision of certain ecosystem services, and state regulatory frameworks incentivizing the development of sustainable resource management can also lead to enhanced biodiversity conservation (Seixas and Davy 2008).

Local people’s involvement in community-based conservation supported by external institutions can result from shared visions between communities and external actors about how to improve natural resource management for the benefit of local people (Schwartzman and Zimmerman 2005). Strong partnerships can act as catalysts and promoters of conservation by reinforcing local leadership and cohesiveness and often providing capacity building and funding to communities (Berkes and Seixas 2004, Seixas and Davy 2008, Shukla and Sinclair 2010). The encouragement of local people to participate in institutionalized conservation practices can also come from intrinsic motivations beyond economic incentives. A collective sense of autonomy leading people to gain access to natural resources, decision-

making power, and land control to contest outside threats, as well as the need to ensure resources for future generations, can lead communities to become engaged in conservation projects (Berkes 2004, 2009, Kosoy et al. 2008, Robinson and Sasu 2013).

Although people's motivations for maintaining traditional community-based management and conservation practices can be related to a collective interest in ensuring land and resource ownership (DeCaro and Stokes 2008), they can also be driven by other well-being concerns. For instance, people from a Totonac community in Mexico manage local forests for conservation because they obtain medicines, food, construction materials, and other key livelihood assets (Toledo et al. 2003). Local actors may also keep engaged in such traditional resource management practices because of cultural reasons, including their worldview and traditions. Local people often participate in the management of community-conserved areas because they perceive such participation as a commitment toward their collective and customary rules (Méndez-López 2014). In India, spirituality and taboos underlie people's efforts to maintain customary forest management practices in sacred forests (Chandrakanth et al. 2004, Ormsby and Bhagwat 2010).

Overall then, local people's engagement in conservation seems to be motivated and triggered by different factors that could have synergistic effects. In what follows, we comparatively analyze three community-based conservation experiences in Latin America to identify particular and common drivers and motivations for conservation and explore their interactions.

METHODS

We investigated and qualitatively compared the drivers and motivations of local people that mobilized them for conservation in three community-based conservation initiatives that differ in their underlying institutional agreements. The initiatives were selected in the context of a European Union research project fostering cooperation between Latin American and European research and civil society organizations (COMBIOSERVE, community-based management strategies for biocultural conservation; <http://www.combioserve.org>). The initiatives involve small rural and indigenous communities whose territories are located in tropical forests of high, but threatened, biodiversity and within or surrounded by government-managed protected areas, which influences access and use of resources. Specifically, they are located on the Discovery Coast of Brazil, in the Calakmul forest in Mexico, and in the Bolivian Amazon (Fig. 1).

Two initiatives consist of locally formalized conservation projects, even though customary rules continue to shape local people's management of natural resources. One is located in the Environmental Protection Area of Coroa Vermelha in South Bahia, Brazil, where a group of Pataxó women created the Jaqueira reserve with the support of NGOs, academics, and conservationists and developed an ecotourism project that employs indigenous families (Pataxó 2011). The other initiative involves the Mexican *ejido*, a form of common property, of Once de Mayo located in the Calakmul Biosphere Reserve (CBR), in the state of Campeche. This subsistence farming community joined a government program of payments for hydrological services from 2008 to 2013 and, from 2013 onward, a second PES program for biodiversity conservation. Our third experience refers to the traditional natural resource management practices

undertaken by the Tsimane' community of San Luis Chico, located in the Pilon Lajas Biosphere Reserve and Indigenous Territory (PLBRIT), in the state of Beni, Bolivia. Tsimane' livelihoods are dependent on traditional and active natural resource management practices that have supported their subsistence and contributed to maintain forest cover in the territory in past decades (Paneque-Gálvez et al. 2013). Community conservation is not formalized locally, but regionally, under the PLBRIT comanagement scheme (Table 1).

The different organization and management rules that these communities have developed to deter deforestation in protected area contexts allow for identifying and comparing a wide variety of drivers and motivations that have led local people to become involved in or maintain existing community-based conservation practices and learn from the resulting institutional arrangements. Our analysis is based on evidence from published literature and ongoing research conducted between 2012 and 2014. Methods of data collection included long-term participatory observation during fieldwork visits to the communities, i.e., 1 month in Jaqueira, 4 months in Once de Mayo, and 2 months in San Luis Chico; 37 interviews, with community leaders and local informants; and 12 deliberative focus groups, including time lines and participatory scenario planning (see details in Table 2).

We conducted a qualitative content analysis of the reviewed literature, including our own research project reports (Schols 2013, Huitema et al. 2014, Ludwig 2014, Ruiz-Mallén et al. 2015); interview transcriptions, verbatim when possible and translated to Spanish in the case of the Tsimane'; and focus group notes (Newing 2011). The first author classified data into two broad predefined categories: (1) drivers, if people mentioned factors or events external to the community leading to local conservation efforts; and (2) motivations, if people mentioned factors internal to the community leading to such efforts.

Drivers were categorized according to the organizational scale, namely, whether the driver originated at the community level, i.e., local, or at a supralocal scale, i.e., municipal, regional, national, or international. Drivers that originated at the local scale were coded as contextual conditions, or those social-ecological characteristics of the community context supporting community-based conservation. Supralocal drivers were classified into three predefined subcategories according to the type of external management intervention that can potentially affect human behavior (ESPA-AA 2008): (1) enablement, including socioeconomic, political, ecological, and/or technological conditions promoting individual and collective participation in conservation; (2) incentives, including financial and economic instruments to encourage community-based conservation; and (3) disincentives, such as policy instruments that contribute to community-based conservation.

Motivations were coded according to three predefined categories related to the psychological needs behind them: (1) competence, or the desire to be able to do something efficiently; (2) relational, or connecting with others, i.e., social capital; and (3) autonomy, or self-control (Ryan and Deci 2000). From the perspective of the competence need, motivations to participate in conservation can be related to economic values, such as the need to improve natural resource management by obtaining monetary rewards at the lowest possible cost (Steg and Vlek 2009), and to noneconomic

Fig. 1. Studied communities involved in community-based conservation in Brazil, Mexico, and Bolivia.

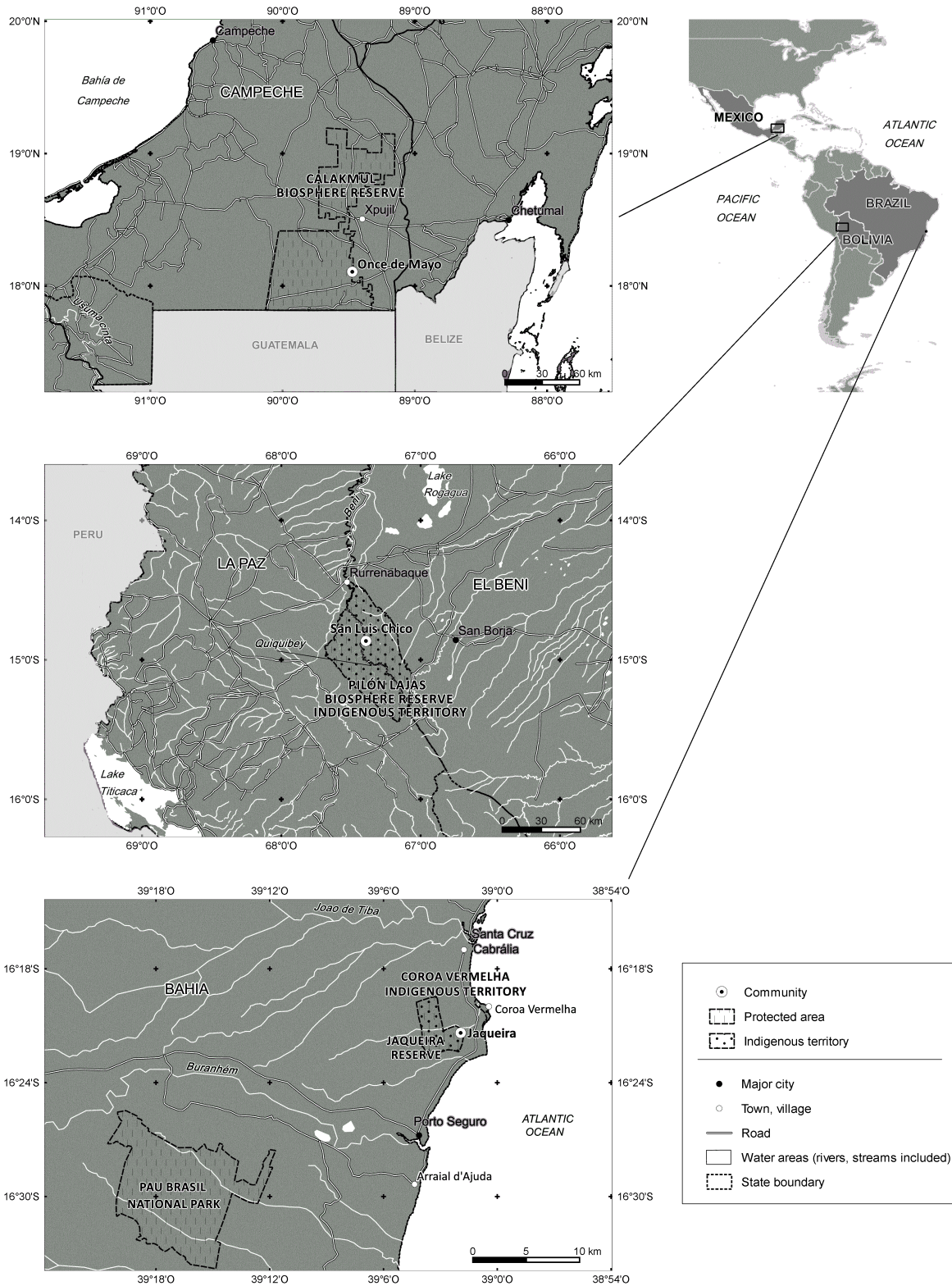


Table 1. Social-ecological characteristics of selected sites.

Community	Characteristics	Jaqueira	Once de Mayo	San Luis Chico
Community-based conservation	Initiative	Ecotourism project	Payments for ecosystem services (PES) project	Traditional natural resource management
	Formalization	Locally with academics and nongovernmental organizations	Locally with government	Regionally with government (comanagement)
	Year of creation	1998	2008	Unknown
	Hectares	827	1436.74	25 (but belongs to a common territory of 436,500 ha)
Location	Municipality	Porto Seguro	Calakmul	Rurrenabaque
	State	Bahia	Campeche	Beni
	Country	Brazil	Mexico	Bolivia
Ecological system	Biome	Atlantic forest	Tropical forest	Tropical rainforest
	Type of vegetation	Mosaic of used mature and secondary forest	Mosaic of used mature and secondary forest	Mosaic of used mature and secondary forest
Social system	Number of inhabitants	~80	350	83
	Number of households	16	78	20
	Ethnic groups	Pataxó	Mestizo, Chol, Tzeltal, Tzotzil	Tsimane'
	Main productive activities	Ecotourism	Subsistence agriculture	Subsistence agriculture, hunting, fishing, harvesting
	Productive activities allowed	Tourism	None	Subsistence agriculture, hunting, fishing, harvesting
Land rights	Land ownership	Indigenous territory	Communal land (<i>ejido</i>)	Native community lands
	Community-based conservation decision makers	Community members	Land rights holders and government	Community members and government
	Inclusion in a protected area	Mata Atlántica Biosphere Reserve Environmental Protection Area of Coroa Vermelha	Calakmul Biosphere Reserve	Pilón Lajas Biosphere Reserve and Indigenous Territory
Changes	Forest cover change (1980-2012)	Slightly decreasing inside the reserve as a result of clearings for building households Significant reduction around the reserve as a result of urbanization	No change in the PES area Significantly decreasing in the rest of the area as a result of slash-and-burn agriculture	Slightly decreasing around the community as a result of clearings for agriculture Insignificant changes in the rest of the area

values, such as the need to be successful in ensuring the maintenance of resources for future generations. Motivations related to building social capital are associated with positive attitudes toward collaboration and the individual's desire to maintain cultural traditions and compliance of customary conservation rules, which are embedded in broader social norms (Foster-Fishman et al. 2001). In this case, the individual's behavior is influenced by the extent to which such norms approve or disapprove of conservationist behavior (Steg and Vlek 2009). Finally, motivations related to autonomy and self-control are related to an individual's, or a societal, need to gain or assert further control over land and natural resources, for example, through claiming or realizing land rights or increasing resource management power and authority in front of other social actors (Ryan and Deci 2000).

COMMUNITY-BASED CONSERVATION IN LATIN AMERICA: THREE EXPERIENCES

Indigenous ecotourism conservation in Brazil

The Pataxó's Jaqueira reserve encompasses 827 ha of protected Atlantic forests within the Coroa Vermelha Indigenous Territory,

in southern Bahia. The reserve includes a village of 16 households temporarily inhabited by its founders, a semirural group of Pataxó people led by 3 women with permanent residence in the nearby village of Coroa Vermelha, now with more than 6000 inhabitants. They make their livelihoods mostly from ecotourism activities, i.e., production and selling of handicrafts.

The Pataxó's territory is part of a wider region traditionally inhabited by this indigenous group. The region had been progressively converted into private farms by settlers who persecuted and repressed the Pataxó (Sampaio 1996). In 1961, the Pataxó were expelled from the largest remaining forest area in the region and relegated to live in cities, where most of them became integrated into the dominant society and renounced their indigenous identity (Castro 2008). Others moved to coastal areas where new indigenous villages were formed, such as Coroa Vermelha in 1972. The expansion of the agricultural frontier, pastures for livestock, and eucalyptus monoculture plantations for cellulose production further increased deforestation rates in the region. To conserve some of the remaining forest in the area, the Mata Atlántica Biosphere Reserve (MABR) was declared in 1993 (Diegues 1995, de Almeida et al. 2008). Although well-conserved

Table 2. Methodological details of fieldwork.

Method	Purpose	Jaqueira	Once de Mayo	San Luis Chico
Interviews	Exploring historical and recent social-ecological events important for local livelihoods and the preservation of forests and biodiversity	Four in-depth interviews with 2 indigenous leaders and key informants who were selected through snowball sampling	Six semistructured interviews with current and past community authorities (2 men) and male and female key informants who were selected through snowball sampling; 20 structured interviews with male and female household heads with and without land rights	Seven semistructured interviews with the community leader and key informants who were selected through snowball sampling (men)
Focus groups (time lines)	Recalling past events and key factors motivating community-based conservation	One focus group with 8 local people (open to all community members, men and women participated)	Three focus groups with a total of 13 community members (open to all community members, mostly men with land rights)	Three focus groups with a total of 24 community members (open to all community members, men and women participated)
Focus groups (participatory scenarios)	Exploring local perceptions and attitudes about future conservation policies and incentives related to the community-conservation initiative	One participatory scenario planning exercise with 10 local people (participation was open to all community members, men and women participated)	Three participatory scenario planning exercises with a total of 15 people (one with women, one with men with land rights, and one with men without land rights)	One participatory scenario planning exercise with 29 people (participation was open to all community members, but only 6 men participated actively in the discussions)

natural vegetation is only present in 8% of the MABR (Galindo-Leal and Camara 2003), it is considered a biodiversity hotspot, mostly for plant species, and is one of the most diverse biomes and important endemism centers of the world (Diegues 1995, Ribeiro et al. 2009, Lino et al. 2011). Despite its relatively small size, the Jaqueira reserve's forests are considered relevant in sustaining biodiversity on the densely populated Discovery Coast of Brazil.

Our analysis suggests that among the set of drivers that contribute to explain the Pataxó's establishment of the Jaqueira reserve and their engagement in ecotourism, enabling political processes have been determinant. International and national movements for indigenous rights, led by the creation of the National Indian Foundation (FUNAI) in 1967, pushed the Brazilian government to explicitly recognize indigenous peoples' exclusive usufruct rights over their lands in the 1988 constitution. This recognition included the Pataxó, who, after more than 20 years of claims, saw 1493 ha of the Coroa Vermelha Indigenous Territory granted in 1997. During land rights recognition, they occupied an area where the reserve was created 1 year later as a reaction toward urbanization pressures and a lack of effective and legally formalized conservation regulations. Even though the surroundings of Coroa Vermelha were declared an Environmental Protection Area managed by the Bahia state government, urban developments were encroaching on forests. Such low conservation enforcement acted as a catalyst to promote local people's engagement in forest conservation within Jaqueira's boundaries.

Interviewees also identified the technical support provided by government, academics, and NGOs to develop the ecotourism project as a key enabling condition for community-based conservation in Jaqueira. In 1998, for example, several experts encouraged three Pataxó women leaders to create an environmental and cultural association to formalize their

activities. One year later, an indigenous Jaqueira tourism association was created, Associação Pataxó de Ecoturismo, with FUNAI's support. Later on, agreements with private tourism enterprises contributed to the development of the ecotourism project. Some Pataxó families also received training, i.e., forest guarding, maintaining trails in the forest, giving cultural performances, and producing and selling handicrafts, from partnerships between the community and government organizations, private organizations, and NGOs, which were key in developing this project. Incentives were also mentioned as very important in nurturing and fostering the establishment of the Jaqueira reserve. The Pataxó received financial support from various sources to build *kijemes*, or traditional houses, an indigenous school, and a tree nursery within the reserve. Furthermore, the increasing influx of tourism in the region because of the opening of Porto Seguro's airport in 1982 also helped to explain the Pataxó's involvement in their conservation project.

In addition to the economic interests at stake, the Pataxó's motivations to establish the reserve related to the needs of asserting ownership and control over their indigenous territory and recovering cohesiveness and identity as indigenous peoples. As one informant explained: "Jaqueira has the objective of recovering our culture and conserving biodiversity" (focus group, August 2012). Informants stressed that children could learn at the village school about Pataxó language, traditions, and myths, and at the same time, the community reserve could act as a strong tie for the inhabiting families and an inspiration for other Pataxó who were interested in exploring other livelihood strategies. In this regard, the reserve is also a manifestation of the community's desire to establish a sustainable livelihoods project that can benefit at least some families (Table 3).

Table 3. Relevant drivers and motivations of our studied community-based conservation initiatives.

Leading Factor	Scale	Type	Description	Jaqueira Ecotourism (Brazil)	Once de Mayo Payments for Ecosystem Services (Mexico)	San Luis Chico Traditional Management (Bolivia)	
Drivers							
Local	Contextual		Low population density	No	Yes	Yes	
			Remote or isolated area	No	Yes	Yes	
Supralocal	Enablement		Inadequate land for cultivation	No	Yes	No	
			Land rights recognition	Yes	Yes	Yes	
			Partnerships	Yes	No	Yes	
			Government technical support	Yes	Yes	No	
			Nongovernmental organization (NGO) and academic technical support	Yes	No	No	
		Incentives		Government subsidies for conservation	No	Yes	No
				NGOs and academic financial support	Yes	No	No
				New market opportunities	Yes	No	No
		Disincentives		Conservation regulations	Yes	Yes	Yes
				Government-driven protected areas	No	Yes	Yes
Motivations							
Local	Competence		Obtaining economic benefits	Yes	Yes	No	
			Guaranteeing resources for future generations	Yes	No	No	
	Relational		Reinforcing social cohesiveness	Yes	No	Yes	
			Trusting local leaders	Yes	Yes	Yes	
	Autonomy		Accessing land and land rights	Yes	Yes	Yes	
			Having decision-making power over natural resources	Yes	Yes	Yes	
			Developing cultural identity	Yes	No	Yes	

Incentive-based conservation in Mexico

Like other communities in the Calakmul region, Once de Mayo was established 30 years ago as a result of colonization programs that brought landless people from other states to this uninhabited region (Haenn 2011). The community, partially located in the buffer area of the CBR, was recognized as an *ejido* by the federal government in 1996. An *ejido* is a form of social property that combines household-managed and formally owned lands with collective management of shared natural resources, such as pastures and forests. Fifty-five people out of 350 inhabitants (INEGI 2014) had formal land ownership and decision-making rights in the community assembly, and the rest of the inhabitants cultivated lands belonging to formal rights holders and did not have voting rights. Livelihoods were based on subsistence and cash crop, i.e., chili, agriculture and cattle ranching, and some families also practiced beekeeping and handcrafting.

The analysis of interviews and focus groups suggests that having land rights and the provision of direct incentives through PES programs were key drivers of community-based conservation (Table 3). Mexico’s attempt to involve rural people in conservation through direct incentives can be traced back to the development of national PES programs in the early 2000s. At the time, such attempts were promoted worldwide by international organizations such as the World Bank and the United Nations Framework Convention on Climate Change (Shapiro-Garza 2013). The Mexican government based its approach on the assumption that direct payments could contribute to increase the profitability of forest conservation and the provision of nonmarketed ecosystem

services by landowners, thus transforming them into conservation allies while increasing rural income (Ludwig 2014). PES programs have been especially implemented in biodiversity-rich and inhabited areas, such as the CBR with the largest continuous tropical forest in Mexico and a significant presence of endangered animals, including the jaguar (*Panthera onca*) and the tapir (*Tapirus bairdii*; Ceballos et al. 2005, Naranjo 2009).

By 2013, more than 50 communities in the Calakmul municipality received support from national PES programs (Ludwig 2014). In Once de Mayo, the PES contract was established under the hydrological services program in 2008 to support the provision of watershed services. It covered 1436.74 ha of forest lands managed in common, which partially included a few *ejido* plots. PES implementation was articulated through an annual payment by the government, equally distributed among these rights holders for guarding the area against hunters and loggers in daily turns of 2 people during 5 years. Landholders rarely spent the payments in conservation activities; they instead bought agricultural equipment and inputs, hired agricultural labor, and paid for medical and education expenses. Households without land rights did not get benefits from PES programs and were not invited to make decisions about the forests targeted by the contract. They worked in temporary conservation jobs, such as monitoring for fire outbreaks around and within the CBR. The protected area also acted as a disincentive for deforestation.

In addition, interviewees mentioned a set of contextual conditions influencing rights holders’ willingness to conserve the commonly managed forests before adopting PES programs. First, poor soils

and extreme climate conditions prevented them from developing mechanized agriculture on forested lands, and only a few households were subsidized by government programs to raise cows and sheep for meat production because of water scarcity. Second, low population density facilitated the conservation of the area because temporal or permanent migration for outside employment was usual among young people without land rights, and the remaining people without land rights could still access sufficient land for cultivation and forest resources elsewhere, mainly by using, borrowing, or renting land from rights holders. Third, lack of well-maintained roads and trails resulted in low access to markets and prevented villagers from engaging in timber logging.

Financial incentives and contextual conditions have thus influenced local people's motivations to engage in PES programs. Participants aimed to maximize their economic benefits and become more competent in the use of land. Rights holders in Once de Mayo regarded PES programs as a means to obtain direct income from a forested area that had in the past been allocated to communal use. Such forested lands were not apt for cultivation, and forests were accessed for firewood collection, logs, and other nontimber forest products for subsistence purposes. This decision, however, was made at the expense of the interests of those without land rights, who felt they were losing from such a deal in terms of resource access and potential income. The relevance of economic motivations for conservation among rights holders is reflected in the fact that, in 2013, they also joined the program of payments for biodiversity conservation, this time targeting 150 ha of forested household-managed plots. In doing so, they expected to maximize their economic benefits in the long term. As a woman participant noted: "One person who cleared his plot is receiving money from selling his cattle or agricultural products. However, those of us who have forests also want benefits. If they [the government] want we keep the forests green, they will have to pay for it!" (interview, October 2013).

Indigenous forest conservation in Bolivia

San Luis Chico is a Tsimane' village of 20 households located on the Quiquibey riverside, in the central area of the PLBRIT, a well-conserved forested area with high levels of biodiversity and endemism (Pauquet 2005). The 436,500 ha of the PLBRIT are collaboratively managed by the federal government and the regional indigenous organization Tsimane'-Moesetene Regional Council (CRTM). The entire area has traditionally been inhabited by Tsimane', Moesetene, and Tacana indigenous groups who since the 1970s have increasingly settled along the 2 main rivers and the road surrounding the PLBRIT borders, which connect the towns of Rurrenabaque and Yucumo. Deforestation is important only around this road, where there is a typical fish-bone pattern of forest destruction because of logging and clearings for market agriculture, mainly led by outsiders (SERNAP 2009). Traditional community management practices consist of subsistence agriculture, fishing, hunting, and gathering timber and nontimber forest products, i.e., *jatata* palm (*Geonoma deversa*) to make roofs. These are usually regulated through customary rules, including taboos. Decisions about new events, i.e., NGO projects, are voted on in community meetings when needed and executed by the local authority, i.e., *corregidor*. Although forest cover surrounding the village remains highly conserved, clearings exist in the riverside flat areas of the community as a result of more than 20 years of

settlement and agricultural activities (X. Velez-Liendo, *unpublished manuscript*).

Interviewees and focus group participants mentioned a set of policy instruments and both enabling and contextual conditions that have led community members to maintain their traditional resource management practices and become increasingly concerned with forest conservation (Table 3). At international and national scales, government and NGO efforts for conservation, launched by the declaration of the Pilon Lajas Biosphere Reserve in 1977, contributed to protect forests from loggers and colonists to a considerable extent. Also, the indigenous claims and protests for territorial autonomy and self-governance across Latin America and globally during the 1980s and 1990s led to the official recognition of indigenous exclusive usufruct rights over their territories, i.e., 1996 Bolivian second agrarian reform. The participation of a few San Luis Chico members in these indigenous protests was organized by their umbrella indigenous organization, CRTM. Soon after, in 1997, the Pilon Lajas Biosphere Reserve was recognized as an indigenous territory (Reyes-García et al. 2014). These legal achievements and subsequent legislative changes, such as the 2009 national constitution, facilitated the Tsimane' to assert further control over their territory and natural resources.

We argue that the political processes related to both biodiversity protection, i.e., disincentives, and claiming indigenous land rights, i.e., enablement, acted synergistically as drivers of community conservation because they resulted in the collaborative resource management agreement between the Bolivian government (National Protected Areas Service) and the regional indigenous organization (CRTM). Such an institutional arrangement founded on a comanagement model further supported communities' traditional livelihoods, including San Luis Chico, while contributing, although not fully effectively throughout all the Pilon Lajas Biosphere Reserve, to reducing deforestation. Logging concessions to national and foreign enterprises decreased considerably within the reserve, and communities' clearings became better controlled through the establishment of land-use zones and legitimate sanctions in many communities (Bottazzi 2009). Specifically, in San Luis Chico, areas were established for slash-and-burn agriculture, timber extraction, hunting and fishing, ecotourism, and conservation, where people can collect nontimber forest products. These formal regulations improved community-based management, as illustrated by a local authority: "Zoning has clearly regulated land uses and logging is now controlled to prevent anyone from cutting down trees; we only can do *chacos* [agricultural plot] in the place designated for agricultural activities" (interview, December 2012).

We noted two contextual conditions at the local scale that also acted as conservation drivers. First, the community's relative isolation in comparison to other neighboring Tsimane' villages located at the margins of the PLBRIT contributed to reducing pressure on natural resources. San Luis Chico is 6 hours away by canoe from the nearest town of Rurrenabaque and is connected to other communities by a small and regularly impassable road. Its inhabitants could thus sell or barter forest and agricultural products only periodically with traders who arrived at the village. This isolation led some families to leave the community. Second, the combination of low population density and high land

availability, 83 people in approximately 600 ha according to the local authority, also facilitated inhabitants' cohesiveness, reducing land-use conflicts and minimizing resource management impacts.

As for Brazil's case, motivations behind community-based conservation leading to avoidance of forest loss also included community members' cohesiveness and desire for autonomy. The Tsimane' people follow traditional forms of social organization, e.g., cross-cousin marriage, so they are closely linked (Huanca 2008). Social capital theory argues that strong social ties among community members can promote a rational use of natural resources for social well-being purposes, while preventing conflicts related to opportunistic behavior, such as those arising from free-riding problems (Ostrom 1990, Berkes 2009). In San Luis Chico, no internal conflicts over land use among community members were reported, and misbehavior was rarely mentioned by informants. Local people collaborated with each other through, for instance, hunting in groups and sharing the meat with other families, which might be facilitated by the fact that competition for resources and market integration were both low. Mutual reciprocity and shared values among community members based on such strong social ties was translated into trusting relationships, including with the community leader, and collective respect for both formal, i.e., PLBRIT-related, and customary rules that regulate natural resource extraction and forest protection. Families' desire for maintaining their cultural identity and standing against outside threats, i.e., colonists and loggers, also contributed toward positive conservation outcomes, at least in terms of forest cover and diversity.

DISCUSSION

We set out to enrich existing conceptualizations of community-based conservation by focusing on the influencing drivers and communities' motivations underlying conservation practices. Our findings suggest that the initiatives studied are managed under practical institutional arrangements for conservation as a result of the interaction between drivers at multiple scales, i.e., incentives, disincentives, enabling, and contextual conditions, and specific individual and collective motivations, i.e., competence, relational, and autonomy motivations, in two main ways. We discuss the drivers and motivations underlying both ways of understanding community-based conservation, including local people's intentionality to achieve the conservation outcome and the challenges for the long-term effectiveness of these initiatives.

Community-based conservation can be understood, as suggested by Seixas and Davy (2008), as a result of drivers explicitly targeted at biodiversity and ecosystem services conservation based on both disincentives and incentives, such as international and national conservation policies and government subsidies for conservation. Our results show that these policy processes and financial mechanisms have been determining factors in local people's economic values and motivation to be engaged in conservation projects. In Calakmul, the conservation initiative was intentionally established by land rights holders to be rewarded with the direct benefits from the PES program and thus mainly supported by an individual economic motivation. The context of increasing access to economic capital in the Jaqueira reserve also seems to have motivated, but to a lesser extent, the Pataxó's ecotourism project.

These economic incentives have been critical in providing monetary income to communities for preserving forests. This is clear in the case of PES programs that have become a political strategy to involve local people in conservation through compliance-driven arrangements based on economic incentives. Social and ecological impacts of such an approach versus other regulatory approaches and traditional management practices for conservation have been well documented and have contributed to the ongoing debate about the pros and cons of economic incentives for conservation (McNeely 1993, Wunder 2007, Muradian et al. 2010, Clements and Milner-Gulland 2015). Our empirical evidence in Calakmul suggests that the formalization of conservation through PES programs has changed the role of the community in management from an active natural resource user to a passive one. The forest area, previously preserved through customary rules, has been included in a PES program through an arrangement between the community and the federal government, in which the former accepted formal management regulations to the detriment of its customary rules. The potentially negative impacts of such formalization on communities' decision-making power have also been observed in India, where the integration of sacred groves into national protected area systems seems to have weakened community members' traditional influence in resource management (Dudley et al. 2009). Similarly, the imposition of external conservation rules was found to weaken traditional management, social norms, and taboos in Madagascar (Jones et al. 2008) and to ignore local knowledge and practices in Mexico (Reyes-Garcia et al. 2013).

In formalized community-based conservation projects, local people's monetary interests might also undermine culturally based principles of conservation if they are rewarded with direct payments, as has been observed in Mexican communities receiving PES (García-Amado et al. 2013). In Once de Mayo, people's increasing access to direct payments seems to be changing their idea of natural resource management from the expectation of getting some benefit from an area that is useless for agriculture, e.g., as a source of firewood, to opportunistic behavior. Social psychological research has indicated that extrinsic rewards can lead to overjustification and a subsequent decrease in intrinsic motivations (Ryan and Deci 2000). In the future, Once de Mayo landholders might stop conserving common forests if they are not paid to do so.

Our findings also suggest that community-based conservation can be conceptualized to consider drivers that are not necessarily aimed at conservation but linked to environmental justice, such as enabling conditions related to international and national movements toward recognition of indigenous rights, which have mobilized local people's motivations for controlling natural resources, i.e., autonomy-related motivations, and strengthening social ties, i.e., relational motivations. Through engaging in community-based management and conservation, local people seem to reinforce or develop a sense of place belonging and value of cultural identity by strengthening their relationship with their local landscape, as we documented in the Pataxó and Tsimane' initiatives. The construction of a cultural identity of the responsible indigenous managers of natural resources has resulted in a political tool to consolidate the ecotourism project in Jaqueira and to maintain traditional management practices in the case of the Tsimane'. This is in line with the theory of

biocultural diversity, which recognizes the tight links between local cultures, including ways of life, and their territories, ecosystems, and natural resources, suggesting that the loss of one can lead to the loss of both (Stevens 1997, Maffi 2005).

Even if maintaining traditional conservation practices can sometimes seem an unintentional form of conservation (Berkes 2009), the Tsimane' case study hints at a certain level of intentionality because such practices have helped indigenous peoples to reaffirm land ownership while preventing outsiders' encroachment. This has also been partly aided by the cross-institutional conservation arrangement involving the regional Tsimane' organization and the government agency in charge of the biosphere reserve. Comanagement of protected areas, and biosphere reserves in particular, can thus be potentially useful for both conservation policy and community-based conservation purposes as long as local communities' territorial rights are respected and their interests considered in decision making. Such outcomes can be more easily achievable if conditions of abundant land, low population density, and limited involvement with a market economy prevail (Redford 1991) and can be much more difficult if demographic and economic pressures increase and weaken collective action (Schols 2013).

CONCLUSIONS

We have shown that community-based conservation initiatives underlying distinct institutional arrangements can also be conceptualized according to the type of drivers and motivations behind them. On the one hand, market and state economic incentives are instrumental in influencing local people's economic motivations to engage in conservation projects because these incentives provide communities with a new source of income linked to forest protection in the short term. On the other hand, motivational factors related to local people's sense of place belonging and cultural identity, social cohesiveness, and desire to achieve control over and access to natural resources, supported by enabling conditions such as political movements for recognition of indigenous rights and partnerships, are key in maintaining traditional management and conservation practices and enhancing ecotourism initiatives.

Our findings contribute to a better understanding of the reasons behind the maintenance or establishment of effective community-based conservation under different institutional arrangements and give insights about the challenges of both incentive-based and environmental justice approaches for future conservation strategies. Because community-based conservation is a dynamic process (Martin et al. 2011), local people's motivations for conservation will change over time. Further research needs to empirically investigate the dynamics of local people's motivations for community-based conservation in the current context of environmental and global change.

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/issues/responses.php/7733>

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