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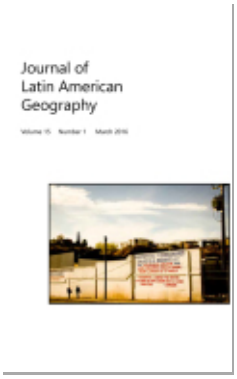

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State Forestry Incentives and Community Stewardship: A Political Ecology of Payments and Compensation for Ecosystem Services in Guatemala's Highlands

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Abstract
Many payments for ecosystem services (PES) programs in Latin America aim to provide motivation for environmental protection through valuing services and providing funds for local development. This article focuses on rapidly expanding state-run Guatemalan forestry incentive programs to show the complexity of this form of PES that compensates participants for good forest management practices. Using a political ecology approach, we investigate the impacts of these incentives on rural Guatemalan participants with regards to local benefits and resource access in two highland townships. Rural participants, through good forest management, have seized the opportunity to receive payments for their preexisting conservation efforts and mobilized community organizations to enroll. Program participants continue to benefit from their land after program enrollment, but participation also opens traditionally indigenous-managed forests to technocratic state control. The program can bring state development funds to impoverished rural households, but only for a limited time and mainly to male heads of households. We argue that for these participants, the non-market forestry incentives demonstrate greater flexibility to meet small landholder needs, a result not often found within market-based PES programs focused on the production of specific ecosystem services. This research offers important insights for the United Nations initiative for Reducing Emissions from Deforestation and forest Degradation (REDD+) by highlighting the social and ecological benefits of community and indigenous-based forest stewardship and the importance of widespread distribution of REDD+ funds to landholders already engaged in sustainable forestry activities.
Keywords: *payments for ecosystem services; political ecology; Guatemala; REDD+, indigenous organizations; environmental governance*

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Resumen
Muchos programas de pagos por servicios ambientales (PSA) en América Latina persiguen motivar la protección del medio ambiente por medio de la valuación de los servicios que generan para la sociedad, y a través de ello proporcionar fondos para el desarrollo local. Este artículo se enfoca en los programas de incentivos forestales de Guatemala los cuales han experimentado una rápida expansión. Nuestro análisis pretende mostrar la complejidad de una modalidad de PSA que compensa a los participantes por buenas prácticas de gestión forestal. Desde el enfoque de la política ecológica, investigamos el impacto de estos incentivos con respecto a los beneficios para los participantes locales y el acceso a los recursos en dos municipios del altiplano. Los participantes en el área rural a través del buen manejo de los bosques, han aprovechado la oportunidad de recibir pagos por esfuerzos de conservación preexistentes, motivando también a organizaciones comunitarias a inscribirse a estos programas. La inscripción en los programas no obstaculiza la continuidad en los beneficios que resultan de sus tierras, pero la participación en el PSA también implica la apertura de los bosques manejados tradicionalmente por indígenas al control estatal tecnócrata. Los programas pueden incrementar los ingresos económicos de los hogares rurales en pobreza por un tiempo limitado pero con frecuencia estos programas privilegian a los hombres jefes de familia que poseen tierras suficientes para la inscripción. Nuestro argumento es que para estos participantes estos incentivos forestales no mercantilizados pueden tener la flexibilidad para satisfacer las necesidades de los pequeños poseedores de tierra, un resultado que no se encuentran en los programas de PSA basados en el mercado y enfocados en la producción de servicios ecosistémicos específicos. Esta investigación puede ofrecer indicios importantes para el programa de REDD+ (United Nations initiative for Reducing Emissions from Deforestation and forest Degradation), ya que destaca los beneficios sociales y ecológicos de la administración comunitaria e indígena de bosques y la importancia de priorizar la distribución amplia de los fondos REDD+ a los poseedores que mantienen actividades forestales sostenibles.
Palabras claves: *pagos por servicios ambientales; política ecológica; Guatemala; REDD+; organizaciones indígenas; gobernanza ambiental*

Introduction

Payments for ecosystem services (PES) are rapidly growing forms of environmental governance that aim to increase environmental protection by financial valuation of ecosystems and the services they provide through payments to those who own or manage land. PES are often considered part of a neoliberal trend over the past 30 years, in which global conservation has shifted from state management to economic markets as the dominant strategy of environmental governance (Corbera, Kosoy, and Martínez Tuna 2007; Pattanayak, Wunder, and Ferraro 2010; Dempsey and Robertson 2012). Proponents of PES argue that putting an economic value on ecosystems and their services incentivizes conservation through internalizing the costs of environmental degradation (Costanza *et al.* 1997; Daily *et al.* 2000). While based on market logic, most PES programs throughout the world represent a form of hybrid neoliberal environmental governance, interacting with "preexisting cultural formations, bureaucracies, labor markets, biophysical natures,

and more" (McCarthy 2005: 1009; Larner 2003; McAfee and Shapiro 2010; Dempsey and Robertson 2012). The commodification of nature has always relied on the role of a state operating at multiple scales to regulate the market (Polanyi 2001). Guatemala's forestry incentive programs are administered through the National Forestry Institute, a decentralized institution funded by the state with a governing board of public-private stakeholders. Thus, Guatemala's PES programs are similar to many across the world where states encourage the management of ecosystems and their services through payments, rather than market-based PES exchanges (Fletcher and Breitling 2012; McElwee 2012; Matulis 2013; Shapiro-Garza 2013a; Shapiro-Garza 2013b; Lansing 2014).

As many types of PES programs proliferate across the globe, their impacts on both livelihoods and ecosystems remain ambiguous. This study focuses on the example of two Guatemalan forestry incentive programs, which provide an opportunity to investigate hybrid neoliberal environmental governance in practice. Using these programs as a case study of compensations for ecosystem services (McAfee and Shapiro 2010), we investigate the impacts of forestry incentives on rural Guatemalan participants with regards to local benefits and access to land and resources. A research agenda that foregrounds compensation for ecosystem services takes into consideration local forest stewardship and preexisting land-uses of community land managers. We argue that in the department of Totonicapán, these forestry incentives that are not linked to market sales of ecosystem services can reinforce successful existing forestry practices, an outcome not often found within quantitative and market-based PES programs. The voluntary nature of participation and direct payments for reforestation and forest protection enable these programs to be of some financial benefit to forest-based communities, although they do not eliminate poverty or deforestation threats. This study contributes to debates on PES program design by drawing on the little-studied yet early generation Guatemalan incentive programs and comparing them to other forms of PES. The research provides insight into the impacts for REDD+, the United Nations initiative for Reducing Emissions from Deforestation and forest Degradation in developing countries, which includes pilot projects in Guatemala.

PES Program Design

PES program design plays an important role in shaping social and environmental outcomes. PES programs range from the compliance-based Clean Development Mechanism and voluntary carbon offsets, to state-led development and conservation incentive programs (Table 1). These programs pay for a range of ecosystem services including carbon sequestration, water provision, biodiversity protection, and general forest conservation activities. Quantification of ecosystem services is difficult, and services such as water filtration and biodiversity are often compensated by payment for proxy activities assumed to structure these services, such as forest conservation (Robertson 2000, 2006; Shapiro-Garza 2013b; Ponette-González *et al.* 2014a). Other programs, such as carbon sequestration for compliance markets, are more carefully measured and monitored to ensure that the service is provided and carbon reductions secured in order to trade ecosystem service credits on the carbon market (Bumpus and Liverman 2011a; Lovell and MacKenzie 2011). Wunder's (2015) broad definition of PES programs incorporates these

radically different designs, arguing that payments must be conditional in all programs. In this paper we focus on forest-based PES programs and argue that the design of the PES program, which is contingent on payment scheme, is key to its social outcomes.

Table 1. Common Types of Payments for Ecosystem Services Programs

Example	Ecosystem service(s)	Governing Entity	Funding Mechanism	Design Model
Clean Development Mechanism afforestation or reforestation certified emissions reduction credits	Carbon sequestration	United Nations Framework Convention on Climate Change (UNFCCC) Secretariat	International compliance carbon market	Pro-market, pro-poor
Voluntary market: verified emissions reductions	Carbon sequestration	Arrangements between voluntary credit buyer and producers via credit providers (private companies or NGOs). Often certified by a third party.	Voluntary carbon market	Pro-market, pro-poor; conservation efficiency
Guatemala's PINPEP and PINFOR Programs	General forest conservation (protection or reforestation)	Guatemala's INAB (National Forestry Institute)	State subsidy (PINPEP funded by donations from Holland from 2006-2011)	Compensation for ecosystem services
Mexico's Pro-Árbol Program[a]	Water provision or biodiversity conservation via payments for forest conservation	Mexico's CONAFOR (Mexican National Forestry Commission)	State subsidy (previously supplemented by two World Bank loans)	Compensation for ecosystem services
Ecuador's Socio Bosque Program[b]	General forest conservation (native forest)	Ecuador's Ministry of the Environment	State subsidy	Pro-market, pro- poor
Pilot REDD+ Projects	Carbon sequestration and storage	UNFCCC coordinating with national governments	REDD-readiness funds from the World Bank's Forest Carbon Fund or the Forest Carbon Partnership Facility. Future funds will be derived from market or fund.	Hybrid models

McAfee and Shapiro (2010) identify several ideological positions with regards to PES: (1) a "conservation-efficiency" perspective holds that market-based programs without social development goals can provide the most efficient use of resources for conservation; (2) a "pro-market-pro-poor" perspective suggests that markets for PES can generate both environmental and social benefits; and (3) a "compensation for ecosystem services" paradigm advocates that rural stewards should be rewarded for good

conservation practices regardless of a demand for ecosystem services in the marketplace. (Table 1) Programs can shift along this spectrum of conditionality requirements and goals, with administrators adjusting program structure to reflect current political struggles and changes in ideological focus of implementing agencies. For example, Shapiro-Garza (2013) argues that initial PES programs in Mexico were founded on discourses of neoliberalism promoted by the World Bank that saw PES as an efficient conservation scheme. Later, agrarian social movements used PES programs as a site for political engagement, transforming the program to recognize the value of sustainable stewardship of peasant producers (Shapiro-Garza 2013a; Shapiro-Garza 2013b). Guatemala's program, in its transition from incentivizing large-scale reforestation for economic purposes to targeting small-scale forestry in impoverished areas with a broader focus on environmental services and social benefits, similarly reflects a fluid compensation for ecosystem services in practice. The co-existence of two different incentive programs in Guatemala illustrates political struggles, divergent ideological approaches to forests, and unequal power relations in the forestry sector.

Interrogating the conservation and development benefits of PES

A political ecology approach provides a unique lens for interrogating PES. With a long history of exploring conservation, land control, and conflict (Hecht 1985; Peluso 1994), political ecology provides critical tools for understanding the contradictions within environmental narratives of PES, struggles over resources, and the role of biophysical nature (Robbins 2011; Corson, Macdonald, and Neimark 2013). Using this political ecology focus on unequal distributions of power, we investigate the ways in which Guatemala's PES programs represent both an opportunity and a burden and for whom.

Previous studies into forestry PES programs have shown that the ability to achieve dual goals of conservation and development is ambiguous and fraught with contradictions (Pattanayak, Wunder, and Ferraro 2010; Ferraro 2011). For example, while PES payments can be valuable in generating supplemental income for rural households and jobs for those hired to complete required activities (Osborne 2013), PES programs may not always bring financial benefits to participants if, for example, upfront costs are not recouped due to high sapling mortality, missed opportunity costs are large, or vagaries in the market for ecosystem services lead to variable payment size (Bailis 2006; Tacconi, Mahanty, and Suich 2013). Participants in PES programs can be restricted in their ability to use their land for other purposes that may not be compensated adequately by program payments or can reduce capacity to adapt to livelihood needs (Osborne 2011; Lansing 2015). While payments can be an opportunity to increase the immediacy of reforestation benefits, payments alone have often been ineffective in addressing all drivers of deforestation (Sabelli 2011; McElwee 2012). In addition, PES tends to produce gender biases by largely benefiting males who own more land receiving PES payments and are disproportionately given decision-making power and provided with technical skills and capacity building (Bailis 2006; Corbera, Kosoy, and Martínez Tuna 2007; Lansing 2015). PES programs can also produce racial biases in contexts where race is strongly linked to landholding size (Aguilar-Støen 2015a). PES programs that attempt to bring development

benefits have often been criticized for failing to reach the poorest potential beneficiaries (Lansing 2014, 2015). In a meta-analysis of 23 PES case studies, Adhikari and Agrawal (2013) concluded that social outcomes like equity, rates of participation, and livelihood benefits were rarely high, and also very variable.

Ecological benefits are equally mixed. Some argue that PES can improve forest health and provide rural users with food, timber, fuel, medicines, animal fodder, fertilizer, windbreaks, erosion control, and soil fertility enhancement (Smith and Scherr 2002). Other studies indicate that planting forests on non-forest land actually reduces runoff that contributes to watersheds in high elevation tropics (Ponette-González, 2014b). However, PES projects may not necessarily be *additional*, and in some cases may not provide substantial ecosystem service benefits compared to traditional land uses (Ponette-González and Fry 2014; Osborne 2015). The determination of additionality, or the proof that payments led to additional forest cover protected than would otherwise occur without PES, remains crucial for market-based PES programs that guarantee a production of environmental services.

These contradictions in PES are illustrative of broader issues of political economy and uneven power relations. In this vein, some view the proliferation of carbon sequestration programs as "carbon colonialism," arguing that these programs use climate change concerns as the discursive basis for a new kind of imperialism (Bachram 2004; Lohmann 2005, 2010, 2012; Bumpus and Liverman 2011). When the world's landscapes can be bid on by international users for their environmental services, this puts the poor at a disadvantage and unable to compete with the wealthy (McAfee 1999). Others argue that assigning a financial value to ecosystems can obscure other social and cultural values of nature (Polanyi 2001; Beymer-Farris and Bassett 2012; Corbera 2012; Osborne 2015). Furthermore, the focus on PES as a technical solution can foreclose effective change because traditional economic and political structures are left intact (McAfee and Shapiro 2010; Boyd and Goodman 2011). While these evaluations have been mainly focused on markets, the Guatemala case has raised interesting results that highlight particular benefits and complexities found in the design of non-market incentive programs.

Guatemala's Forestry Incentive Programs: PINFOR and PINPEP

Forests in Guatemala, particularly in the Western Highlands where this study takes place (Figure 1), are important economic and cultural resources that have been expropriated, privatized, and nationalized (Wittman and Geisler 2005). The incentive programs are overseen by Guatemala's National Forestry Institute (INAB or *Instituto Nacional de Bosques*). The INAB's governing board includes representatives from national government ministries, township governments, forestry educational institutions, the forest industry, and environmental NGOs (Birner and Wittmer 2006; Aguilar-Støen 2015b; INAB 2015). A 1996 Forestry Law created the INAB and designated that it would jointly supervise and monitor all forest use with township (*municipio*) governments, including issuing licenses for family consumption of firewood collected on any type of land tenancy. Many Guatemalans have not obtained these licenses due to lack of information for the need for licenses and the process of obtaining them, inability to pay, inconvenience,

conflicts with local communal land management norms, and a fear of state institutions collecting their information. Although boundaries are often disputed, many townships have title to large swaths of forests and communities also retain forests for communal use. Thus, large areas of forested landscapes are under the control of decentralized yet formal government institutions such as the INAB and townships, which can at times conflict with long-standing informal indigenous institutions with limited financial resources to maintain communal lands (Elías, Larson, and Mendoza 2009).

The decentralized and autonomous INAB administers public funds for the two national PES programs that are the focus of this study: PINFOR (Forestry Incentive Program or *Programa de Incentivos Forestales*) and PINPEP (Forestry Incentive Program for Owners of Small Landholdings Used for Forestry or Agroforestry or *Programa de Incentivos Forestales para Poseedores de Pequeñas Extensiones de Tierra de Vocación Forestal o Agroforestal*). The first incentive program promoted the forest industry and aided large landowners, while the second was created with the goal of supporting small-scale landowners. The two programs provide annual payments for 5-10 years (currently non-renewable) in exchange for management of natural forests for production or protection, natural regeneration, forestry plantations, or agroforestry systems, depending on the program and its modality (Decreto Número 101-96, Ley Forestal; Resolución No. JD. 01.35.2010, Reglamento de PINFOR 2010; Decreto Número 51-2010: PINPEP; Resolución No. JD. 01.14.2011: Reglamento del PINPEP). Enrollment requires management plans drafted by a certified forestry technician registered with the INAB in most cases and verification from the INAB in annual reviews. Often this process is facilitated through a township forestry office or NGO that may retain a percentage of the annual incentive payment in exchange for enrollment support or a direct payment upfront to a university-trained forest technician who drafts the work plan. These programs do not explicitly value or measure a chosen ecosystem service, but rather provide a "subsidy" incentivizing forest health. Thus, these programs fall within the compensation for ecosystem services paradigm (Grieg-Gran, Porras, and Wunder 2005; McAfee and Shapiro 2010). The payments are disseminated upon completion of activities deemed necessary for forest health (creating firebreaks, achieving minimum tree density, maintaining low reforestation mortality, removing undesirable species, etc.) and there is no trading of PES credits on any market. The program is centrally subsidized and currently has no international funding ties, although the first 5 years of PINPEP (2006-2011) were partially financed by the Dutch development and cooperation agency (Aguilar-Støen 2015b).

The INAB launched PINFOR in 1997, targeting areas with a minimum size of two hectares or greater. The stated goal of the program was to sustainably increase forest stocks available for Guatemala's economic development, support the forestry industry, and incentivize natural forest protection for environmental services (Boscolo, Dijk, and Savenije 2010; Resolución No. JD. 01.35.2010, Reglamento de PINFOR 2010). The vast majority of PINFOR payments go to large landowners, but participants also include communal forest users, townships, and bundles of landowners entering a group project (Elías, Larson, and Mendoza 2009). Additionally, the legislation emphasizes reforestation over other modalities, as 80 percent of the funds were destined for reforestation and

maintenance of voluntary forests, leaving 20 percent for natural forest preservation (Decreto Número 101-96, Ley Forestal). Appropriate land ownership documentation is required in the national cadaster (*Registro General de la Propiedad*), which many Guatemalans do not have. Smaller landowners without two hectares to enroll [45 percent of landowners (Aguilar-Støen 2015b)] can only enter the program if they combine small plots together under an official registry document (often held by a township). According to the INAB, between 1998 and 2012 PINFOR disbursed over US$184 million to reforestation and natural forest management projects (Table 2), stimulating "the revalorization of forests in economic and ecological terms, including for communal forests" (Elías, Larson, and Mendoza 2009: 30). However, PINFOR has not been allotted sufficient money from Congress to cover all payments, so several projects' payments were cancelled or delayed in 2014 and 2015, which some argue targeted communal participants or preservation rather than plantation projects because of PINFOR's foundational focus on supporting the timber industry (Rosa 2014; Bolaños 2015). PINFOR is scheduled to end in 2016, and Congress approved a modified replacement of PINFOR (called Probosque) in October 2015, although the regulations specifying the law in practice were not finalized at the time of writing (Reyes Gómez 2015; Decreto Número 2-2015, Probosque).

Table 2. National enrollment in PINPEP and PINFOR from the INAB[a]

Program	Total Area of Land Enrolled (ha)	Total payment[b]	Total number of beneficiaries
PINFOR (1998-2012)	328,577.32	US$181,885,379.03	760,355
PINPEP (2007-2014)	46,585.71	US$34,332,352.06	139,734

a) Based on information published on the INAB's website (INAB 2015)

b) A conversion rate of Q7.9531=1 USD on December 24, 2012 is used throughout this paper.

In reaction to the inaccessibility of PINFOR funds for their smaller-scale and community-based forestry conservation efforts, many social organizations protested the enrollment requirements and spurred the creation of PINPEP in 2006 (Elías, Larson, and Mendoza 2009; Ordoñez 2011; Aguilar-Støen 2015b). Without property documents in the national cadaster, participants in PINPEP can enter smaller tracks of land (minimum of 0.1 hectares), by obtaining a certification of land ownership from the local township government (Decreto Número 51-2010: PINPEP; Resolución No. JD.01.14.2011: Reglamento del PINPEP). While still intending to increase Guatemalan forest stocks for commercial use, PINPEP was also created to protect ecosystems and promote rural development, shifting the incentives' focus (Decreto Número 51-2010: PINPEP; Resolución No. JD. 01.35.2010, Reglamento de PINFOR 2010; Resolución No.

JD.01.14.2011: Reglamento del PINPEP). PINPEP was a landmark piece of legislation as it was created at the insistence of forest-based community organizations, recognizes oproperty rights outside of the national cadaster, and focuses on social benefits (Aguilar-Støen 2015b). However, it is important to note PINPEP's plots (which began a decade later than PINFOR's; see Table 2) are only 14 percent of total PINFOR coverage, and total payments are 18 percent of PINFOR's payments, indicating an imbalance in program impacts. The recently approved Probosque program has modified PINFOR to allow broader participation by reducing land size requirements to 0.5 ha and increasing the types of landownership that can be included, although some grassroots forest organizations are still wary of the INAB's interpretation of what qualifies as appropriate ownership documentation. The law adds the possibility of future ecosystem service compensation outside of Guatemalan government funding, such as REDD+ or other initiatives linked to climate change mitigation and adaption.

Using PINFOR and PINPEP as a case study of a compensation for ecosystem services program, we demonstrate that in the department of Totonicapán, these forestry incentives can reinforce relatively successful existing forestry practices. This illustrates that while the additionality of the incentive program may be low, this program design has generated some socioeconomic benefits with minimal constraints on forest access. Spurred by small landowner demand, this non-market compensation program is a move towards recognizing rural stewardship of forests that monetarily values the work of small-scale foresters or community forest producers. The ability to achieve this recognition, however, is constrained by lack of funds allocated to the programs and a continued prioritization of larger-scale projects. While program benefits can be gained through their flexible designs based on conditional forestry practices rather than measured service provision, issues remain regarding gender inequity and bureaucratic obstacles to the full participation of forest-based communities.

Agrarian Context of the Western Highlands

This study takes place in the Western Highlands department of Totonicapán (Figures 1 and 2), where a long history of communal forestry and continual reliance on alpine forest resources makes these incentives both popular and contentious. The Western Highlands is the most densely settled area of the country outside of Guatemala City, and ninety-five percent of farms are considered sub-subsistence (Veblen 1977; Veblen 1978; Wittman and Geisler 2005). There are few large landholdings (*latifundios*) in the region, unlike other departments in Guatemala, as a result of land dispossession in the lowlands and population concentration in the Highlands (Handy 1994; Grandin 2000; Katz 2000). This condition provides an opportunity to investigate the impact of the incentives on rural participants who maintain small landholdings, rely on forest resources, seek diversified sources of income, and maintain traditions of forest conservation. At the same time, this region contrasts greatly with areas characterized by larger landholdings and lower elevation forests in the northern and pacific lowlands of Guatemala. Forested spaces remain a source of identity for many indigenous groups living within the Highlands, giving "significance to the collective identity and strengthen the feeling of community in the face of a historically exclusive and centralized state" (Elías *et al.* 2009: 9).

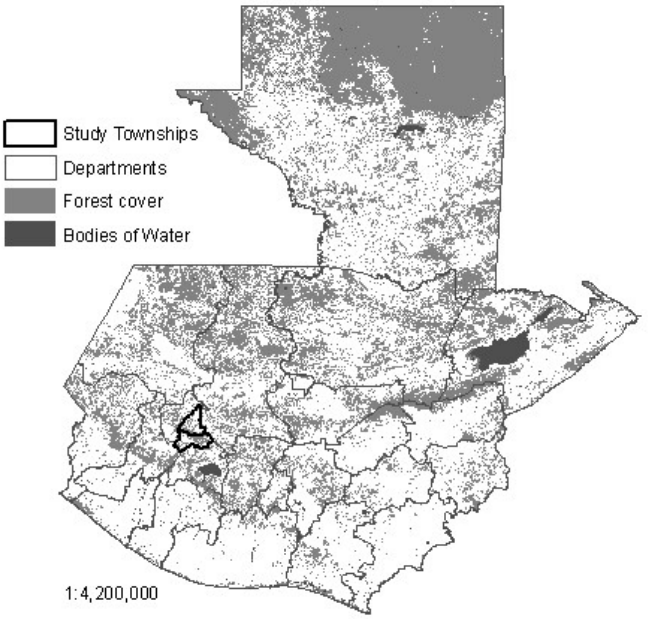

Figure 1. Map of Guatemalan forest cover and study area. Guatemalan forest cover in 2012 with the study area townships (municipios) of Santa María Chiquimula (north) and Totonicapán (south) within the department (departamento) of Totonicapán in the Western Highlands highlighted. Administrative region data provided by Secretaria de Planificación y Programación de Guatemala. Forest cover data provided by the Grupo Interinstitucional de Monitoreo de Boques y Uso de la Tierra (GIMBOT 2014).

Indigenous populations of the Western Highlands have a tumultuous historical and contemporary relationship with the Guatemalan State. Attempts at state-sanctioned land reform in the mid-20th century ended abruptly with a CIA-backed coup in 1954, initiating an era of increasing state violence and acts of genocide (Grandin 2000; Oglesby and Ross 2009). Ending with the 1996 Peace Accords, the legacies of Guatemala's 36 year Civil War include displaced populations, distrust of the state, disruption to means of subsistence, continued lack of justice for war crimes, and destruction of social organization (Grandin 2000). Impunity is still endemic, as seen in the 2012 killing of six citizens of Totonicapán by the military during peaceful protests of raised electricity rates (Clouser 2009; Falla 2012). State-led development interventions continue to prioritize an agroexport model that increases social inequality, conflict, and environmental deterioration (Elías and Nakata 2010). For many rural participants in the programs, the INAB is their main interaction with a state institution apart from agencies that rely on violent coercion, thus creating opportunities for rural Guatemalans to interact with a bureaucracy in new ways (Ferguson and Gupta 2002; Larson 2008).

Figure 2. Photo of the study area landscape by the first author.

Today, most rural households in the Western Highlands participate in subsistence agriculture dedicated to corn and beans and rely on forests for fuelwood (Veblen 1978; Goldín 2009). Additionally, Highland economies are based on petty industrial production, petty commodity agricultural production, the production of non-traditional agricultural products for export, and industrial garment production for export (Goldín 2009). Migration to the United States and seasonally to coastal areas reduces but does not eliminate poverty (Wittman and Johnson 2008; Goldín 2009). Current forest threats include increased harvest of forest products, outbreaks of the round-headed pine beetle (*Dendroctonus adunctus*, known locally as *gorgojo*), and increased investment in mining operations and hydroelectric dams (Conz 2008; Elías, Larson, and Mendoza 2009).

Research Methodology

This study took place in the townships of San Miguel Totonicapán and Santa María Chiquimula located in the department of Totonicapán. Santa María Chiquimula has a population of over 48,000 inhabitants and Totonicapán, the department seat, a population of over 134,000 (INE 2011). The two townships were chosen based on the high level of activity in their township forestry offices. They are adjacent to each other but exhibit different patterns of land tenure and incentive enrollment. San Miguel Totonicapán (hereafter known as simply Totonicapán) hosts a large township-managed forest, several *parcialidades* [communal forest connected to a patrilineal clan (Elías and Wittman 2005)], and correspondingly has more large-scale group PINFOR and PINPEP projects and very few individual PINPEP projects (only 13 in 2012). Santa María Chiquimula has very few

PINFOR projects but one of the highest number of PINPEP enrollment rates in the department (with 102 projects in 2012 when interviews with participants took place). The results of this study are primarily based on interviews with those participating in PINPEP, either on small plots of private land or larger communal forests.

The first author collected data in June - August 2012, 2013, and 2014 through interviews and participant observation at reforestation events, community nurseries, ecotourism project construction, and workshops hosted by NGOs and government agencies. Interviews were completed with 7 committees that directed forest management (*juntas directivas*), 32 participants in communal and/or individual PINPEP projects from 7 *aldeas* (towns) (in 2012), and 29 "intermediaries" that worked for the INAB, NGOs, or township forestry offices. Interviews with participants addressed motives for participation, previous forestry work, program requirements, benefits and costs, and changes in access to land. Intermediaries' interviews focused on these themes in addition to participation trends, program origins, and forest concerns beyond the incentives. Juntas directivas were asked to describe their organization around managing communal forests. At times, contact with participants relied on the township forestry offices that had enrolled them in incentive programs (perhaps biasing the sample), but snowball sampling later provided participants outside the township. Only 4 out of 32 incentive participants interviewed were female (see "Access to program benefits"). All direct participants in the incentives were indigenous Maya K'iche', with most speaking K'iche' as their primary language; intermediaries were a mix of indigenous and mestizos. While not exhaustive, the interviewees are representative of patterns of incentive enrollment in these two locations due to contrasting land histories: communal projects in Totonicapán with only a handful of individual participants, and many individual projects concentrated in a few communities that frequently also had communal projects in Santa María Chiquimula.

Forestry Incentives in Totonicapán

Forest landscapes in Totonicapán

Totonicapán is home to pure conifer, mixed broadleaf-coniferous, pine-oak forest, woodland, brush, and grassland habitats (Conz 2008). While not the most biodiverse forests in the country, these Highlands landscapes remain economically and ecologically crucial to local livelihoods, national water supplies, and carbon sequestration efforts. More than 90 percent of department households use firewood as their primary fuel source (Conz 2008). Over half of the country's thirty-eight watersheds have their origins in the Western Highlands (Elías, Larson, and Mendoza 2009; Gustavo and Suarez 2011), including five in the township of Totonicapán alone.

The department of Totonicapán is known for its majority indigenous population of K'iche' Maya and strong tradition of communal forestry protecting high-elevation forests. Ninety-five percent of the residents of the department of Totonicapán are K'iche' Maya (Wittman and Geisler 2005), whereas Guatemala as a whole is 65 percent indigenous (Elías and Wittman 2005). Totonicapán is one of four departments that experienced a nearly zero (0.04 percent) net loss of forest in the period 2006-2010 (Regalado, Villagrrán, Pérez, Castellanos, Martínez, and Incer 2012). The strong culture of communal land tenure

has contributed to conservation, as communal lands are better preserved than private, state, or township forests (Wittman and Geisler 2005; Elías, Larson, and Mendoza 2009). Totonicapán's area consists of 44 percent communal lands, which is much higher than the average of 14 percent communal forest cover nationwide (Elías, García, Cigarroa, and Reyna 2008). Communal forested lands exist in many forms, including township forest run by the local government, communal forests managed by villages, or parcialidad forest connected to a patrilineal clan (Elías and Wittman 2005; Wittman and Geisler 2005; Conz 2008). For many residents, forests and communal lands are a source of identity, political power, and independence (Elías, Larson, and Mendoza 2009).

The success and sustainability of communal land management is associated with local rules and norms that dictate land use (Ostrom 2000; Agrawal 2001). These forests often rely on a tradition of civic volunteering to provide forest guards, leadership on committees (juntas directivas), and workers in tree nurseries (Conz 2008; Elías, Larson, and Mendoza 2009). Many communities have sanctions that prohibit commercial use and monitor private use of communal forests (Elías Gramajo and Pinto Díaz 1997; Elías, Larson, and Mendoza 2009).

This forest conservation success has been maintained despite the fact that Totonicapán experiences high poverty rates (63 percent of the department's population is categorized as impoverished) (Wittman and Geisler 2005). Rural population density is high, leading to ownership of plots insufficient in size for subsistence (Elías and Wittman 2005; Wittman and Geisler 2005). Among interviewees, the average size of maize (*milpa*) and other vegetable fields was 0.31 hectares (N=24) and privately owned forested land not enrolled in an incentive was 1.44 ha (N=24).

Participation in forestry incentive programs

Similar to national trends, the department of Totonicapán has rapidly growing participation in PINPEP while PINFOR's enrollment is lagging as it ends in 2016. This growth in PINPEP is particularly fast in Santa María Chiquimula, where the township's forestry office, local NGOs and participating neighbors actively encourage enrollment.

Despite this growth, some landowners are still reticent to join the programs. A common sentiment expressed by participants and managers was that many neighbors or whole communities had chosen not to enroll in the program due to fears of land expropriation by the state. People indigenous to Totonicapán historically utilized lower piedmont lands seasonally, which were seized by coffee growers backed by the state in the late 19th century, and the vast majority of small-scale landowners in Totonicapán today lack titles to land in the national cadaster. One PINPEP participant remarked, "When [a NGO] gave us the information, we told people in the community who this is from, but they don't want it because they are scared. [They think] that you give them the land title [*escritura*], and immediately they rob your land, take your land. Better not, they said. … I entered so that people realize this isn't true, that they are not going to take your land." It is no surprise that many are wary of a program that requires submitting documentation of landownership, receiving payments, and annual inspections by a government institution in a context characterized by nearly total absence of state presence other than the police

and the military (Elías and Wittman 2005). Other individuals and groups actively reject state intervention in forest management not out of fear but out of a desire to maintain forest governance independence. However, pockets of enrollment continue to grow as participants demonstrate to neighbors that they successfully receive incentives, and potential participants increasingly approach intermediaries for enrollment help.

Others lack trust in community leaders to manage a group incentive in a way that would distribute the benefits fairly. An employee of the township's forestry office remarked that one community could not reach an agreement to enroll their communal land in PINPEP because, "There are a lot of people that … think that the mayors are going to keep the money, so, almost nobody wants these incentives." The incentives provide an opportunity for some working in forestry activities to receive monetary compensation for their work, but not all who do forestry work on communal land have succeeded in joining (often due to land title issues) or chosen to enroll in the incentive program. This creates tension among those who complete the same type of work yet receive different financial benefits. Similarly, Elías, *et al.* (2009) argue that formalized natural resource management has changed customary rights distribution and relationships with the Guatemalan state.

Additionality in forest protection

Interviews in Totonicapán confirmed that continual use of forests for firewood, lumber, soil retention and other needs has fostered an ethic of reforestation and conservation, well before the incentives arrived. Communal lands have long been managed through committees, forest guards, and nursery workers, and this conservation knowledge is applied to private forest management. Eighty-eight percent of households interviewed said they had been engaged in reforestation activities on their own land before the incentives, some for decades. A history of forest management is reflected in the fact that in 2012, 85 percent of total PINPEP projects in the two study area townships were payments for protecting existing forests, rather than agroforestry or reforestation projects. The incentives appear to supplement existing practices rather than subvert them, and introduce a few new methods of management or additional protections. However, there is still severe and recent deforestation in patches of these townships, particularly Santa María Chiquimula. The most forest-conscious communities or individuals may be the ones joining the incentives. While this does reward them for their long-standing conservation practices, additionality in the incentives program may remain low unless the programs are able to pull other rural producers away from deforestation habits, a concern seen among other PES programs (Pattanayak, Wunder, and Ferraro 2010; Ferraro 2011; Ponette-González and Fry 2014).

Program benefits and issues of concern

The most commonly cited reason for enrolling in the incentives was to improve the physical condition of forests, which many found difficult to adequately support without the incentives. Enrolling in the program forced interviewees to learn new management practices, committed them to work in forestry, or provided resources for outcomes they hoped to accomplish (similar to the findings of Elías, Larson, and Mendoza 2009). For example, a participant in Totonicapán argued that "we had been working because this is

our land, but it isn't constant. … Now with the incentive, it's a commitment that we have." Several remarked that the ability to protect their forests against wildfires had increased: "We did not know how to protect, how to manage [for fires]. We have heard about it, but didn't do it. PINPEP came and give us the idea on how to do it." While the majority of participants did not object to incentive guidelines, several program managers expressed concern that the list of species for reforestation was very limited for the alpine region and focused on commercialization of forests, particularly within PINFOR. Additionally, projects must be approved and annually reviewed by the INAB's forestry technicians, who retain the authority to reject projects or require changes before payment. Others took advantage of the opportunity to receive payments for work in which they were already engaged. One participant in a communal PINPEP project remarked that, "At the beginning, our companions realized that we always reforested in the mountains, without any benefit. … They had heard that there is an incentive that incentivizes people to work, so we began to participate in PINPEP." These participants did not find forestry work difficult to achieve but appreciated the benefits and recognition for their forest stewardship.

The second most commonly cited reason for joining the incentive programs was to receive the payments, which has the potential to significantly boost rural households' income depending on the size of the project (Table 3). Estimated annual expenditures needed to support participants' families basic needs averaged $1,886.06 (Q15,000 per year). In comparison, the average annual forest incentive among interviewees was $1,429.53 for a private project with an average size of 4.19 ha, although this varied widely. The costs of incentive inputs such as trees for reforestation projects and paying wage laborers were not assessed in this study. In fact, several participants had purposefully shifted their work away from other activities such as traveling to other departments for work to focus on the incentive activities.

Table 3. Land enrollment and compensation among interviewees (2012)

Land Tenure	Average Size of Land Enrolled	Area of Land Enrolled	Average Annual Payment[a]	Range of Annual Payments[a]
Communal	Per community 12.14 ha	7 ha – 15.54 ha	Per community US$2,477.97	US$1,999.85 -$2,794.46
Individual	Per individual 4.19 ha	0.08 ha – 12.14 ha	Per individual US$1,429.53	US$30.11- $3,377.53

a) A conversion rate of Q7.9531=1 USD on December 24, 2012 is used throughout this paper.

Incentives provide local employment, support for households, and community project funding. Commonly cited uses for the incentives by individuals included reinvesting in costs spent on the project or buying food and clothing for their household. Others had

used their incentives to buy a car, a mill, pay for schooling, or pay medical bills. Hiring labor to work on the projects distributes financial benefits. With communal incentives, several villages divided up the payment among all households or paid community members for the work related to incentives, giving a small amount to each household. Others pooled money for communal projects such as road repairs or building community meeting rooms. One community in Totonicapán directed several forms of support towards an ecotourism project meant to reduce reliance on extractive forest resources. They used their first PINPEP incentive to build a zip line in their expanding ecotourism project, eventually distributing profits to each registered member of their community. Additionally, Totonicapán's forestry office used their PINFOR incentive for their large township forest to hire more technicians, forest guards, and nursery workers, which are significantly contracting as these payments end.

The common desire for more incentive projects reported by participants indicates that most current participants in Totonicapán believe the benefits are worth the obligations. Nearly half of interviewees (48 percent) had entered multiple plots of land into PINPEP, started at different times, and wanted to enter additional land. Eighty percent of respondents had no criticisms of the programs when asked about their dislikes. Others expressed dissatisfactions with a lack of technical support in completing the project, inspectors not keeping appointments, concerns that Congress might not continue to finance the program, the inability to harvest trees, the complexity of the certification process, and insufficient funds for completed work. Interestingly, all those who expressed these dissatisfactions either failed to meet quotas for reforestation or recently joined the program and had not yet received their funds.

In sum, an increasing number of rural landowners have joined incentive programs in order to support pre-existing forestry activities and to reap their financial benefits. Elías *et al.* (2009) have argued that the INAB's incentives provide funds to invest in crucial forestry activities, but communities can become dependent on them where before the incentives there often existed a strong ethic of volunteerism surrounding communal forests. Similar PES financial benefits have been seen in rural areas with few other income options (Bailis 2006; Osborne 2013). In Totonicapán, changes in land and resource access do exist, but are minimal because most are enrolling forested plots for protection and many participants see changes as compensated by the payments. However, the most vulnerable forests may be open to harvest if only those most interested in forest conservation with low opportunity costs join the program. This reflects many scholars' concerns that PES programs are not incentivizing additional forest protection, as there is no evidence that conservation would fail to occur in the absence of payments (Pattanayak, Wunder, and Ferraro 2010; Ferraro 2011; Ponette-González and Fry 2014). Nevertheless, the Guatemalan case demonstrates the importance of regular payments to bolster the income of marginalized agrarian communities, particularly as payments are received yearly instead of an initial lump sum (Tacconi, Mahanty, and Suich 2013). In contrast, Wittman and Caron's (2009) analysis of Guatemala's first carbon forestry offset program concluded that participants (who did not receive direct payments) mistrusted the municipal forestry offices funded by the offsets and did not want to reforest because planted trees must be

approved by forestry offices for harvest. The state incentives, in contrast, offer optional enrollment among individuals and direct payments for reforestation as well as forest protection. All participants must interact with their municipal forestry office to enroll, and continual mistrust likely accounts for the reticence of some in joining the programs.

Access to Program Benefits

Reported changes in access to the benefits of land were minimal, in part linked to the preexisting practice of forest management. The vast majority of incentive projects in the two townships protected existing forests, and no reforestation for the incentives occurred in agricultural land of those interviewed. Without incentives, most of these plots were likely to remain forested land, with incentives affecting the quality and consistency of forest management rather than absolute forest cover.

While the amount of forest protection added by the programs may be limited, low opportunity costs can increase benefits to participants and enhance the rural development goals of PINPEP. Only three interviewees expressed difficulty in obtaining firewood after enrolling in the incentives. Most participants found access to firewood in communal forests, additional private forest plots that were not enrolled in the incentive, or removing dead and downed logs, thinned trees, or branches from within PINPEP plots. The majority of participants said they would continue managing their forests similarly after the incentives, but many would also take advantage of the forest for firewood and lumber in these plots. The need to ask the INAB for permission to fell a tree in an incentivized area has affected some participants: many felt it was a simple procedural step, but others found it burdensome. For example, one participant remarked that, "the regulation from the project is that we can't cut trees….It's very difficult … because of the timber." Firewood, on the other hand, can be obtained through lopping branches and is thus less likely to be constricted by the incentives. In sum, the majority of participants acknowledged that regulations for the incentive program had affected their land use, but this was not necessarily a problem for them.

As with any development program, the forestry incentives have not achieved a uniform distribution and have the potential to exacerbate social inequities. Within the townships of Totonicapán and Santa María Chiquimula, only 8 projects in 2012 listed female recipients as the primary beneficiary, compared to 78 projects that distributed resources to males. Women represented only 10 percent of the committee (juntas directivas) representatives interviewed. Forestry work for the incentives is generally within the realm of traditional men's work despite the fact that women collect firewood and forest products (Elías and Wittman 2005). Men are the main participants in reforestation, maintaining fire protection, forest guarding, employment in nurseries, and work as professional forest technicians or managers. Financing predominately male roles runs the risk of continually valuing their work at the expense of women's and increasing inequity within households. Certification of land ownership required for PINPEP is often not difficult to obtain [unlike more stringent requirements seen in other PES programs, including PINFOR (Lansing 2014)], but still often remains in males' names, continuing to limit women's ability to directly receive the incentives. A prioritization of men's activities

as the object of development intervention has been observed in other PES programs focused on forestry (Bailis 2006; Corbera, Kosoy, and Martínez Tuna 2007) and a variety of development interventions (Carney 1996; Wallace and Coles 2005).

While the incentives do reach relatively impoverished households, the poorest community members are unable to access them. Those who do not own enough land to maintain a maize crop (*milpa*) in addition to a forested plot are excluded, although the land-poor may gain employment working on others' incentive projects or benefit from communal incentives. Additionally, work must be completed and verified well before participants receive the payment, effectively blocking those without access to capital or assistance needed to initiate these forestry projects. Some NGOs work with incentive participants to help front the costs through loans, provide work plans for free or at minimal cost, or pay for the forestry technicians to complete the enrollment process. Some forestry technicians writing work plans only ask for payment after the participant receives the incentive. Additionally, many community nurseries trade work in the nursery for trees so land users do not have to purchase them. However, without access to these means of circumventing upfront costs, enrollment in the incentive plans can be uneven. This reflects many other PES investigations that found that the populations who do not have sufficient land or capital to enter into the projects are excluded (Grieg-Gran, Porras, and Wunder 2005; Bailis 2006; Corbera, Kosoy, and Martínez Tuna 2007; Osborne 2013). Thus, the incentives can actually facilitate the creation of localized elites who are able to benefit from the incentives at the expense of others (Osborne 2013).

Technocratic and Bureaucratic Barriers

The bureaucracy of the INAB has also presented institutional barriers to effective participation. Obtaining the proper documentation to enroll projects can be difficult, particularly if there are land conflicts or if the forestry technician makes mistakes in the paperwork. Although the PINFOR and PINPEP laws have committed 1% of the national budget to fund the program, this still requires authorization by Congress. In the past, annual checks have arrived late because funds had not been allocated by the Ministry of Finance. In 2014, several PINFOR projects were legally cancelled by the INAB due to insufficient funds. Critics argue that communal and protection PINFOR projects were disproportionately selected for cancellation while privately owned plantations remained a priority (Rosa 2014). This decision-making reflects power asymmetries found in the governing board of INAB, where community forestry organizations are not directly represented despite their efforts to change the composition of the board during the creation of PINPEP and Probosque laws (Birner and Wittmer 2006; Aguilar-Støen 2015b).

At other times, landowners need more institutional support to complete projects than often available. Despite participating for three years, one interviewee had never received payments due to high tree mortality on his reforestation plots. Often it falls to NGOs involved in forestry in the region to fill in the gaps left by the INAB with respect to training participants for success in the program. This illustrates another aspect of neoliberal environmental governance where roles previously fulfilled by state actors are now taken up by non-state groups due to the financial limitations of the INAB to perform

this role. Nevertheless, the INAB technicians also have the capacity to reject projects for incomplete technical requirements, demonstrating the continued power of the state.

Conclusions

As outlined above, the most common (but not universal) sentiment among interviewed participants in PINPEP in the department of Totonicapán is one of satisfaction with payments for continuing their preexisting forestry activities. However, payments only last for a maximum of 10 years (depending on the project type), and the same plot of land currently cannot be re-enrolled. Most participants felt it would be difficult to no longer receive incentives, as they may have to seek out new sources of support. Many are working around this by enrolling additional plots of forested land after their initial participation so they can receive payments extending to a later date.

These incentives have provided participants with an opportunity to shape the Guatemalan state and an opening for the INAB to influence traditional forest management. Critics argue that the economic development of the forestry industry has always been the main goal of the incentives, framed in the INAB's discourses of forests as primarily economic goods (Wittman and Geisler 2005; Elías, Larson and Mendoza 2009). The INAB remains the final arbiter for approving and verifying incentive projects within the prescribed modalities, intervening into private and communal forested spaces and informal institutions that lack independent financial resources (Elías, Larson, and Mendoza 2009). Standardization of management through the INAB, its licenses, university-educated forestry technicians, and incentives can devalue the localized and diverse systems of "practice, knowledge, norms, rights, local governments and local arrangements or 'instituionalities' that have persisted for many generations," taking power over forests away from local communities (Elías and Wittman 2005: 288).

However, these incentives are also utilized by many forest users to bring needed funds to their informal institutions and gain public recognition for their conservation, and these groups are now placing more trust in the state for supporting these efforts (Aguilar-Støen 2015b). Adoption of state-required forestry practices does not necessitate a complete abandonment of traditional forest management practices and non-economic connections with forested spaces (Elías, Larson, and Mendoza 2009). Additionally, small-scale forest users have gained some modifications in PINPEP regulations that benefit communities and continue to demand for Probosque to meet more community needs rather than those of the forest industry. Organized PINPEP recipients continually confront the Ministry of Finance over the inadequate allocation of funds for the program, calling for accountability and compliance from the Guatemalan state. Similar to Shapiro-Garza's finding in Mexico, Guatemalan PES programs were to some extent coopted by indigenous and small-scale forest user groups, although this is a continual struggle (seen in the lack of a community representative on the INAB's governing board, for example) (Shapiro-Garza 2013a; Aguilar-Støen 2015b).

The form of Guatemala's PES programs – *compensation* for ecosystem services – has increased the social development benefits of the program because they provide funds for forestry activities completed rather than quantified ecosystem services generated. PINPEP and PINFOR evaluate the health and integrity of forest plots, which

provides more flexibility for participants to manage forests for their needs within the INAB's guidelines, rather than focusing primarily on the production of certain ecosystem services. Similarly, Wittman and Caron (2009) argue that the preoccupation with carbon sequestration redirected scarce resources away from focusing on benefits to small farmers who did not receive direct payments for participation.

The incentives remain a tool available for communities and individuals to use to achieve their forestry goals, with both positive and negative outcomes. The programs are not capable of eliminating foundational drivers of deforestation, similar to critiques of other PES programs (McElwee 2012). They also do not address core issues of rural land inequality and its link with poverty in Guatemala; this disregard of land tenure has made establishing the programs politically feasible (Aguilar-Støen 2015b).

At the same time that these forestry incentives are growing, Guatemala is preparing for the UN's REDD+ program. PINFOR and PINPEP are potential models for REDD+ with respect to payment and monitoring systems. The new Probosque legislation leaves open the possibility of national or international funds to compensate for ecosystem services like carbon sequestration, although currently very few existing incentive projects would likely qualify for the more stringent requirements of avoided deforestation in high risk areas (Juárez Calderón 2014). To date, permanent carbon sequestration and specific links to REDD+ have not been articulated.

There are many forestry and indigenous groups who are interested in the funding potential of REDD+ within Guatemala, but many are wary. Unlike the current forestry incentives, REDD+ payments rely on the quantification and demonstration of carbon sequestration. While the funding mechanism has yet to be determined, REDD+ is likely to be tied to international carbon markets (Osborne, Bellante, and vonHedemann 2014). In meeting additionality goals, REDD+ is also likely to target larger areas that are at higher risk of deforestation. REDD+'s focus on slowing deforestation in response to climate change will likely ignore areas of Guatemala like Totonicapán that have a history of strong forest conservation or forestry plots owned by many small landholders. In addition, REDD+ funds funneled through the state may not reach smaller landholders. Representatives from indigenous organizations in Guatemala emphasize the need for real and effective inclusion and collaboration with traditional land users, giving REDD+ the opportunity to strengthen the existing conservation culture. The shift in focus to carbon accounting and potential market linkages risks making REDD+ less beneficial to rural participants than current incentive programs.

Developers of Guatemala's REDD+ program can draw upon the experiences of PINPEP as REDD+ risks prioritizing carbon sequestration over rural needs. This can be achieved by viewing forests as whole social ecosystems rather than international carbon sinks, even moving beyond the INAB's timber priorities. Payments can encourage sustainable forestry activities, often found under common property management, rather than carbon accounting and should be linked to stable funds. REDD+ will be more equitable if all rural producers, not just those in high deforestation risk areas, have access to REDD+ funds. REDD+ financing funneled through existing decentralized channels, such as townships, can help prevent national-level capture of REDD+ funds, although it should also move into the hands of traditional forest managers and indigenous groups.

Guatemala's forestry incentive programs illustrate the complexities that emerge in enacting PES programs on the ground. PINFOR and PINPEP give ecosystems a monetary valuation, but do not alienate the services produced by forests as tradable units in "free" markets (Castree 2008). The original economic focus of PINFOR has since been hybridized with rural demands and other state goals. Small producers' experiences with PINPEP in Totonicapán differ from other PES programs because of the lack of focus on one ecosystem service, the ability to join without official land titles, voluntary individual participation, and payments for existing forest protection. However, these programs exclude many women, those who do not have sufficient land or capital (social or financial) to join, or those who are excluded by the technical, expert-oriented approach of the INAB. While the foundations of PES may have flaws in providing technical rather than long-lasting solutions that sideline other, less lucrative values of nature, there is still room for agency within a state-run program. The argument that "ecosystem services 'might be both a tool of dispossession and tool for challenging dispossession'" (Mansfield 2007: 496; Dempsey and Robertson 2012: 771) holds true in the case of Guatemala. Nuanced empirical political ecological analyses can illuminate these contradictions and point to an equitable way forward.

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