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The Untenured Forest: Land, Labor, and New Environmental Value in the Brazilian Amazon

Abstract: Tropical forests are newly valuable because of the carbon they sequester. Yet how that value is distributed remains undetermined. In the Brazilian Amazonian state of Acre, a government program shifts forest carbon's value away from land—where mainstream thinking would attach it—in part because many poor people cannot obtain formal land tenure. Forest carbon is made into a public resource, rather than the private wealth of large landowners, that the government disburses based on another factor of production: labor. This analysis of the shift from land to labor shows how new forms of environmental value can enable governmental redistribution.

Introduction

The Amazon rainforest has long been renowned for its resources. Minerals, timber, and rubber have fuelled extensive wealth, and extensive conflict. Recently, a new resource has been created: the forest carbon in the Amazon's hundreds of billions of trees and prolific plantlife. They take in carbon dioxide, releasing the oxygen and storing the carbon in their trunks, roots, branches, and leaves and then in forest soils when they decompose. Conversely, when forests burn or are otherwise degraded, they release carbon. With extensive deforestation, tropical forests now act as a net carbon 'source' that significantly contributes to climate change, rather than as a carbon 'sink' (Baccani et al. 2017).

The dominant market-based approaches to combating climate change make forest carbon financially valuable. This new resource can act like so many existing ones, sustaining inequity, violence, and dispossession. Yet, I argue in this article, it can also facilitate governmental redistribution to areas, such as those in the Brazilian Amazon, that have received little such support, even in the heyday of the twentieth-century welfare state. With a changing climate and the environmental value it generates, environmental protection becomes a means not only of development (West 2006) and governing people (Agrawal 2005, McElwee 2016), but also of state social welfare provision in a kind of twenty-first century 'tropical Keynesianism' (Hecht 2012, 5).

Complex relationships between land and labor can be essential to the distribution of new forms of environmental value and warrant analysis (see Pahnke, Tarlau, and Wolford 2015, 1072). Their shifting relationship is the focus of this article based on an analysis of a program in the Amazonian state of Acre, Brazil called the System of Incentives for Environmental Services (SISA). Adopted in 2010, SISA enables state redistribution by shifting forest carbon's value away from land ownership. The shift contravenes a key component of theory and practice surrounding forest carbon and 'payment for environmental services' (PES): the importance of clarifying land rights. In Acre, land ownership is not clear and many poor rural people are unable to obtain formal rights, a legacy of the political ecology of rubber production and Brazilian colonization. The lack of clarity is not unique to this corner of the Amazon: many places where forest carbon and PES programs are enacted lack clear formal land rights. In part because of this, SISA is at the forefront of a worldwide trend away from positioning land rights as a prerequisite for reducing climate-changing deforestation (Dehm 2016).

SISA distributes carbon's value based on another factor of production: labor. The program makes forest carbon into public wealth—a resource for the Acreano government to distribute—rather than the private wealth of land owners. Reductions in deforestation can be sold as carbon credits to outside polluters. The government redistributes the profits to, among others, *posseiros*—poorer people without formal land rights—based on their labor. Through SISA, the state deems some labor to be important for reducing deforestation, marking it as what I call 'environmental labor.' SISA endows this environmental labor with forest carbon's value, distributing what can amount to a form of government social welfare provision premised on environmental ends.¹

SISA adopts what can be seen as a reworked labor theory of value through using the neoliberal concept of 'ecosystem services.' Yet SISA employs the concept of ecosystem services to cultivate neoliberalism's apparent opposite—expanded state welfare provision—for a state government concerned about rural poverty. The environment has long been a target of biopolitical governmental power. Through the effort to address climate change and the forms of value it engenders, I suggest, it may also increasingly become a means through which states provide for rural people's welfare, however inadequately.

My argument proceeds in three parts. First, I analyze SISA in the context of neoliberal environmental governance and local history. Second, I examine the emphasis on land rights in environmental marketization efforts, the challenge that unclear land rights pose to this paradigm, and the work-around that SISA offers. Next, I examine how SISA shifts carbon's value from land to environmental labor, making forest carbon into a means of increased production and governmental redistribution. I conclude by

¹ This distribution entails its own power dynamics and politics, which I examine elsewhere (Greenleaf n.d.).

considering how the recognition of environmental labor and the redistribution it enables may support the continuing pursuit of land.

Neoliberalism and environmental governance in Acre, Brazil

SISA enables the sale of carbon credits, which represent reduced emissions from deforestation. This approach aligns it with efforts to monetize carbon and, more broadly, create markets for ecosystem services and use conservation to spur development (West 2006). Critical scholarship reveals the forms of exclusion, dispossession, and inequity that market-based and other neoliberal forms of environmental governance can engender and aggravate (e.g., Heynen et al. 2007; Lansing 2014; McAfee 2012; Osborne 2011, 2015).

Yet neoliberal environmental policies often manifest very differently than the efficient markets envisaged by their proponents and the dispossessive ones feared by their critics. Rather, they may be modified by local histories and resources' materiality, functioning more like subsidies or pre-existing environmental governance than as efficient markets (e.g., Bakker 2005; McAfee and Shapiro 2010; McElwee 2016; Milne 2012; Milne and Adams 2012; Osborne and Shapiro-Garza 2017, Shapiro-Garza 2013). Terms such as 'not quite neoliberal' (e.g., edited volume by de Freitas, Marston, and Bakker 2015), 'hybrid' neoliberalism (e.g., Larner 2003), and 'post-neoliberal' (e.g., Woford and French 2016) signal neoliberalism's continued relevance but contested and undetermined manifestations. Other scholars have illuminated redistributive logics attendant in some neoliberal policies and practices, in as diverse forms as universal basic income (Ferguson 2015) and municipal heating (Collier 2012). Analysis of SISA contributes to this scholarship by illuminating how apparently neoliberal forms of environmental governance can act as a means of government redistribution.

SISA as an external market

Ethnographic fieldwork I conducted in Acre (2012 and 2013-2014) showed how SISA functions differently externally and internally.² Externally, SISA resembles and strives to be a market, packaging reductions in carbon emissions below a 'business-as-usual baseline' rate as carbon credits to sell to outside polluters. In this, it is part of a widespread effort to access money for reductions in deforestation and forest degradation worldwide (REDD+). REDD+, an approach developed during the late aughts, aims to provide compensation for reductions in tropical forestry emissions and to integrate forests into international climate mitigation efforts (Pistorius 2012).

SISA is a particularly well-respected REDD+ program due to Acre's history and environmental governance (see below), as well as SISA's state-wide approach that is analyzed in this article. As a result, SISA's administrators have successfully accessed international funding, receiving financial support from NGOs and governmental entities, including the German development bank KFW. Through a program called REDD+ Early Movers, KFW bought €\$25 million worth of Acreano carbon credits (valued at US\$5/ton of CO₂) through two contracts worth 16.5 percent of reductions in Acreano forestry emissions between 2011 and 2015. The Acreano state set aside another 17.7 percent as a 'risk management mechanism' (KFW n.d., 2), leaving it with approximately two-thirds of emissions from that period left to sell. In interviews and official documents, the Acreano government and KFW characterize the contracts as 'results-based finance,' rather than market transitions, with purchased carbon credits

² My research included semi-structured interviews with rural people, bureaucrats, and others involved in efforts to reduce deforestation, participant observation at government agencies, workshops, and community meetings, and surveys of 240 rural families conducted with the Center for International Forestry Research as part of its Global Comparative Study of REDD+.

'retired' instead of traded or used to compensate for German emissions. Yet the purchases monetize carbon just as market transactions do.

New and potential sources of funding are also forthcoming. At COP 23 in November 2017, the British and German governments signed agreements for GBP\$17 million and €\$10 million worth of Acreano emissions reductions respectively (Zílio 2017). Additionally, since a 2010 Memorandum of Understanding with the state of California,³ Acre has been publicly positioned as the most likely source of REDD+ offsets for the important California cap-and trade carbon market.⁴ Their acceptance would bring significant money into Acre and would also constitute the first time that REDD credits would be admitted into a cap-and-trade market.

SISA's use of carbon credits and the concept of 'ecosystem services' marks it as neoliberal. Yet its internal manifestation is different than critical analyses of neoliberalism might anticipate, as I examine in the following sections. SISA not structured like a market internally. Instead, it makes forest carbon into a form of state wealth primarily redistributed to poor rural people, pointing to emergent forms of social welfare distribution through environmental governance.

SISA's history and context

SISA's use of apparently neoliberal environmental governance for redistributive ends emerges from both its national and local contexts. It can be productively understood as part of the post- or hybrid neoliberal approach adopted in Brazil and other Latin American countries beginning in the early aughts (e.g., Escobar 2009; Morais and

³ The agreement also includes the government of Chiapas, Mexico but problems with its REDD+ program have meant that

⁴ Since 2013, certain California polluters (e.g., power plants) have had to obtain 'emissions allowances,' including offsets, in order to pollute.

Saad-Filho 2011; Wolford and French 2016). Federal administrations led by Brazil's Workers' Party (2002-2016) embraced neo-extractivism, using revenue from expanding intensive agriculture and extractive industries to fund redistributive social programs (Morais and Saad-Filho 2011a). SISA, which also aims to create carbon credits for export, intensify agricultural production (see below), and direct resulting revenue to the rural poor, fits within this approach.

SISA is also the product of Acre's unique history. Acre's colonization and economy during the nineteenth and twentieth century rubber boom centered almost exclusively on rubber production. The form of rubber production was consequential: it entailed tapping latex from the state's bounty of *living* native rubber trees, rather than felling them as in some neighboring areas (Hecht 2013). Rubber tappers, who largely stayed in the forest after the rubber economy collapsed in the first part of the twentieth century, built on this political ecology in a social movement in the late-twentieth century. They organized against southern Brazilian cattle ranchers, who moved to the Amazon during Brazil's military dictatorship (1964-1988). The ranchers deforested and violently expelled the tappers and indigenous people they encountered, including assassinating the famed rubber tapper leader Chico Mendes. The movement connected forest protection with rubber tapper's rights, articulating a new and widely celebrated vision of sustainable development (Keck 1995).

The rubber tapper movement gained political in power in Acre after Brazil's transition to democracy in 1988. The state's Workers' Party, which has been in power in Acre since 1999, was organized by members of the rubber tapper movement and in 1998, a charismatic forest engineer-turned-PT politician was elected governor. Jorge Viana's administration (1999-2006) and the one following it (2007-2010) were self-branded the 'Government of the Forest' and centered on forest protection.

This government and its successors created what can be considered an environmental elite, some of whom I quote in this article as SISA developers and administrators. They have significant governmental power, are educated and relatively well-off, and are quite socially cohesive, having worked together for many years. Yet they are also connected to those they govern and the state's social movement, in a version of the type of state-society amalgamation that developed in other PT-governed parts of Brazil (see edited volume by Wolford and French 2016). The state hired and contracted many 'social movement people' and non-Acreano environmentalists who moved to the state, developing a large environmental bureaucracy. It also encouraged local people to join the environmental elite through programs like a university major in forest engineering and new institutions like the School of the Forest, which educates rural people to be agroforestry agents. Additionally, the state fostered connections with some nongovernmental and social movement organizations through adopting relatively participatory forms of governance (Kainer et al. 2003; Schmink and Cordeiro 2009).

The environmental elite adopted a forest-oriented developmental model based on a basic premise of Acreano rubber production and social movement: that the forest could be protected through its use. Achievements included increased rubber production, decreased deforestation, significant economic growth, and improved government administration (Kainer et al. 2003; Schmink and Cordeiro 2009; Schmink et al. 2014). Yet continued rural poverty and increased enforcement of the Federal Forest Code (which requires Amazonian landholders to keep 80 percent of their land as forest) starting in the aughts generated pressure to provide more material support for rural people.

SISA was passed by the Acreano legislature in 2010 and framed as both a way to provide that support and as a culmination of the rubber tapper movement. Developed by

nongovernmental and government actors over the previous few years, SISA both reflects the power of the environmental elite and the continued support for the forms of forest protection it advances amongst those able to and interested in participating in state-sanctioned forms of participation. Surrounding SISA, these forms include consultations with nongovernmental, rural, and indigenous organizations, submission of written comments, and participation in SISA's administration by four nongovernmental groups through its Commission for Validation and Accompaniment. Some indigenous groups, rural organizations, NGOs, and academics remain critical of SISA as a form of 'climate colonialism' (e.g., CIM 2012; Xapuri Declaration 2017). But many others have embraced its market-based approach in part because it directs benefits towards indigenous people, rubber tappers, and other poor people championed by the rubber tapper social movement. Shifting forest carbon's value away from land ownership enables this redistribution.

Moving away from land ownership and its exclusions

Land tenure features prominently in scholarship, policy, and practice surrounding forest carbon and ecosystem services. In the absence of policy to the contrary, the value of forest carbon and other ecosystem services tends to attach to land, accruing to those who formally own it.⁵ Yet in places where forest carbon projects are developed, land's ownership is often unclear or socially complex, filled with informal customary claims that cannot or should not be reduced to cadastral maps. This can complicate forest carbon and other ecosystem services projects and make them more exclusionary of those without formal land rights (e.g., Corbera and Brown 2010;

⁵ Property rights to carbon (carbon rights) can be and sometimes are legally separated from land (see Greenleaf 2011).

Lansing 2014; Mahanty et al. 2013; Unruh 2008). SISA's developers sought to move away from property and its exclusions, in what can be viewed as a prominent example of a shift away from making clear land tenure a requirement for REDD+ (Dehm 2016).

The case for property

Much of the scholarship surrounding REDD+ and PES emphasizes 'clarifying' land tenure rights.⁶ This emphasis can be traced to at least four lines of thought within environmental scholarship and practice. Their agreement positions land rights as the holder of carbon's new value.

The first line of thought sees property rights as essential for carbon markets, drawing from the law and economics scholarship that underpin them (e.g., Coase 1960; Dales 1968). In neoliberal environmental governance, markets are understood to be an efficient and effective way to manage resources. Property enables a trust seen to be essential for markets to function: it allows sellers to know what they can sell and buyers to feel secure about their purchases (Dales 1968).

This emphasis on clear property rights is often interpreted as a need to assign individual land tenure. For example, Börner et al. (2010) call “[I]and tenure chaos...the single largest impediment...to REDD implementation” (1275) and “the exclusiveness of rights to the land providing the [ecosystem] service” a “fundamental precondition” of the approach of paying for “ecosystem services” like carbon sequestration (1273). A SISA administrator explained the importance of land titles to forest carbon projects to me this way: '[I]f you do a [forest carbon] project, it could be that today it works and tomorrow the land owner appears and says, ‘No, that land is mine. I’m sorry, the

⁶ Julia Dehm (2016, 191-192) documents some of the most prominent pronouncements supporting land tenure reform in policy papers.

[carbon] credits that you [the buyer] bought aren't yours, they're mine.'⁷ Land rights have to be clarified for sales of forest carbon to be secured from such market-unsettling confusion.

The emphasis on land links to a second reason for the prominence of property: the understanding of land rights as a foundational right from which rights to other resources flow. The perceived role of insecure land tenure as a driver of deforestation is a third reason for the centrality of land rights in carbon's marketization. Lack of land rights is seen as driving a 'tragedy of the commons' (Hardin 1968), with variations of public and private land ownership proposed as solutions. Land needs to be clearly owned, under this logic, to avoid resources' rapid squander (see Araujo et al. 2009).

Finally, a very different reasoning also advocates for land tenure rights: that employed in the interest of the tens of millions of people who depend on forests for their livelihood. New resources attract prospectors who can expel smallholders and traditional peoples. Activists and scholars position different forms of land rights, such as collective use rights, to protect against this dispossession. Forest carbon's valuation appears as both a threat and opportunity to secure long elusive land rights (e.g., Larson et al. 2013; Loft et al. 2015; Sunderlin 2014).

The centrality of land rights unites these divergent logics. They promote an array of tenure forms, from individual freehold tenure to collective use rights. Yet they all position land rights as central to forest carbon's effective and equitable management.

⁷ Interview September, 2014. Unless otherwise specified, all quotations are my translations from Portuguese from interviews or conversations during my research in Acre.

Acre's unclear property rights

Mainstream literature often assumes that land tenure can be easily 'clarified,' which is part of why REDD+ has been portrayed as a cheap fix to climate change (e.g., McKinsey and Company 2009).⁸ Yet in Acre, and many other places where forest carbon projects are enacted, clear individual property arrangements do not exist, waiting to be discovered just beyond the grasp of the formal legal system. Instead, culturally specific, overlapping, and/or conflicting claims are more common.

In Brazil, such confusion has been described as a 'strategy of rule' by a distant government over a vast territory (Holston 2008, 121). State policies encouraged informal individual settlement as a way to colonize the expansive '*interior*,' offering the formal possibility—but often practical impossibility—of earning land title through occupation and use, often demonstrated through deforestation (Araujo et al. 2009). Fraudulent practices, such as the production of fake documents, has also been an essential tool of land claiming (Campbell 2015; Holston, 2008). In Acre and elsewhere in the Amazon, the government-sanctioned migration of ranchers and others discussed above exacerbated this confusion, resulting in land conflicts and massive deforestation.

While violent land conflicts have declined in Acre in recent years, land rights remain uncertain. Ranchers, indigenous groups, former rubber bosses, rubber tappers, and smallholders (themselves often the descendants of rubber tappers) assert claims to overlapping parcels of land, reflecting Acre's history of usufruct rights for rubber production, claims based on the geography of rubber tapper settlement, and the in-migration of groups with divergent political ecologies. Existing law does not offer

⁸ In contrast, the fourth category of scholarship outlined above, which emphasizes forest people's rights, tends to advocate for redistributive agrarian reform and tends not to portray it as easy or cheap.

resolution since competing claims often contain some legal merit. There is often no apolitical way to formalize land claims, no 'real' landowner to be discovered. Reflecting this uncertainty, the Acreano state land agency (Iteracre) gave up in the early 2010s, postponing most rural land regularization efforts indefinitely, like so many such efforts in the Amazon. This situation recalls those in the many other parts of the world where landownership is neither clear nor can be easily clarified without politically-charged agrarian reform.

Posseiros and the exclusions of property

In the confusion and conflicts around land and its ownership, many Brazilians, including in Acre, lack formal title to the land they occupy or claim. Poorer residents are also often unable to obtain title. Property is an exclusionary institution, in other words, not only in moments of originary enclosure (Marx [1867] 1990) and in ongoing land titling efforts like those in Brazil (e.g., Baletti 2012; Campbell 2015; Oliveira 2013), but in quotidian limitations in access to title. REDD+ and PES projects that require formal land rights and attach forest carbon's value to them can reinforce these exclusions.

Acre's private REDD+ projects, developed contemporaneously with SISA, demonstrate property's exclusions. SISA permits REDD+ projects on privately held land, deducting their forest carbon from the state's tally. In partnership with two small United States-based companies, a few large Acreano landowners own five private REDD+ projects ranging in size from 22,000 to 200,000 hectares. They generate carbon offsets to sell to companies and individuals seeking to compensate for their own emissions for reputational in the so-called 'voluntary' carbon market.⁹

⁹ For example, soccer's international governing body FIFA bought carbon credits from one of the Acreano projects to offset emissions from administering the 2014 World Cup in Brazil.

Obtaining formal land tenure was one of the first steps these landholders undertook to start their REDD+ projects. That even such large-scale and wealthy landowners lacked land title indicates the level of informality surrounding land ownership in Acre. And even for them, the process for getting tenure could be expensive and lengthy, as one of them explained to me in a narration of the 10 years it took him to get title. Obtaining tenure was a private process, entailing lawyers and real estate specialists, companies to conduct land surveys and record GPS points, and 'friendships' with people in private registration companies (*cartários*) and the public land agency Iteracre. It also required compiling many documents, and sometimes creating fraudulent ones, that demonstrated land occupation and use (deeds of sale, tax receipts, bank documents, etc.) back over a hundred years the rubber boom. Nonetheless, those with means could eventually obtain formal title and, therefore, start private REDD+ projects.

Indigenous groups and other so-called 'traditional people' can also sometimes secure land rights, although they can be difficult to obtain and offer insufficient protection. Article 231 of the Brazilian Constitution recognizes indigenous peoples' 'rights to the lands they traditionally occupy' and creates a positive obligation for the government to demarcate inalienable 'indigenous lands.' Acre's rubber tapper movement also created a novel form of common property land tenure called an 'extractive reserve,' in which rubber tappers receive collective usufruct rights (Keck 1995). Within the reserves, rubber tappers can maintain claims based on *estrada* trails that link rubber trees (traditionally, each rubber tapper worked three trails (Bakx 1988)). The first reserve was created in Acre in 1990 and the idea has since been adopted into federal policy and in other countries.

Yet many rural Acreanos are not indigenous, nor do they tap rubber. They also are too poor to pursue tenure through private means. Instead, they are excluded from

formal property—and therefore from the resources, like forest carbon, that attach to it. In relationship to land rights, they are known as *posseiros*. In Acre, many are the descendants of rubber tappers or former rubber tappers themselves who abandoned the practice in recent decades due to land conflicts, rubber's low price, and the arduous physical labor and low social status of its collection (Hoelle 2015). This abandonment leaves them in a precarious position. They do not have legally cognizable land claims based on ethnicity, labor, or history. They might get tenure through moving into a government settlement, but space can be limited and social movements that advocate for the creation of settlements are not active in much of the state.

Posseiros's land claims based on occupation and use are often legal. Under the Brazilian Constitution and other laws, rights to public and private land accrue after a specified period of occupation and use (one year and a day and five years respectively). Yet, unlike large landowners, they are often unable to get formal title. For example, one couple I knew, who were trying to get title to 12 hectares of land that they had occupied for decades, estimated that they had visited the state agency Iteracre some 40 times. Their hope was that, with formal title, they could start a forest carbon project based on their protection and restoration of the forest on the land. Yet, even with access legal counsel and the legal merit of their claim, they were unable to get land title. Iteracre officials denied them access to the GPS points its agents had taken and the couple could not afford to hire a private company to take new ones. Neighboring claimants disputed the boundaries of their claim and Iteracre's president refused to issue the title without all boundaries in the 'area' (whose boundaries itself were unclear) being agreed upon, as a 'matter of public policy,' he explained in one meeting. Without land title, the couple's efforts to start a private forest carbon project were stalled. Only *posseiros* who lived as the vulnerable informal occupants of Acre's few private REDD projects could

potentially access some of forest carbon's value, to the variable extent that the project distributed revenue to them. Attaching forest carbon's value to land and its ownership reproduced the exclusions of Brazil's property system.

Moving from land to a 'jurisdictional' approach

Understanding this context, SISA's developers sought to sidestep property and its exclusions, contravening conventional thinking that forest carbon's value should attach to land. Instead, they created a 'system' encompassing the entire state—pioneering so-called 'jurisdictional' REDD+—rather than a geographically-bound REDD+ project, as they had originally planned. This detachment of forest carbon's value from land is not always recognized in mainstream scholarship and discussions of SISA, which can assume that SISA revenue goes to landholders (e.g., Palmer, Taschini, and Laing 2017). Yet the approach is increasingly important. While it reflects the uniqueness of Acre's history and the position of *posseiros*, SISA is also a prominent example of a growing shift away from an emphasis on land rights in REDD+ and PES (e.g., Asquith, Vargas, and Wunder 2008; Dehm 2016; Pagiola, Arcenas, and Platais 2005).

Many SISA developers and administrators told me that they thought that land regularization was important to encourage sustainable forest management, echoing a logic discussed above, but they also did not see it as a prerequisite for SISA to work. In fact, such a requirement would create a Euro-American-centric quagmire, one of its developers told me:

We are in Latin America. When discussing a European model or an American model, you have centuries and centuries of structuring and regulation of property rights. And you fortunately succeeded in Europe to title property... Here you do not have it. So if you follow a path in Latin America

applying European models of the conception of title...you will never be able to do emissions reductions or carbon programs linked to the land, because you need to solve an earlier problem, which is the problem of titles. Nor in the next 100 years, unfortunately, will we...be able to do this.¹⁰

No simple and apolitical fix to property is possible in Acre or in many of the other places where forest carbon projects are enacted. Attaching forest carbon's value to land would threaten to mire SISA in a morass of property regularization.

Moving away from property was also an attempt to move away from its exclusions. The concern that confusion over land tenure would impact the access of poor people to SISA benefits was brought up in early consultations around SISA (IMC n.d.). SISA was, as one of its developers described it to me, meant to be like Robin Hood, taking money from the wealthy, who would have received it in a project-based approach, and distributing it to the poor, including *posseiros*. *Posseiros* are more political important than the common English translation—squatter—might suggest. They are celebrated as essential to the colonization of the vast country and are often supported by the Workers' Party, which has sometimes worked in uneasy partnership with social movements to secure their land rights (Wolford 2010b). In Acre, many *posseiros* also governed as culturally important 'forest people.'

SISA sought to turn forest carbon's value from the private wealth of a few large landowners into public wealth to be distributed. It was, in this sense, an implicit claim of state ownership of forest carbon. The number of carbon credits that the Acreano state can sell is determined by calculating aggregate deforestation in the approximately 86 percent of the state (164,000 km²) estimated to be forest. This approach decouples forest

¹⁰ Interview August, 2014.

carbon's value from the geographical location of forest protection or destruction. As a KFW document describes, SISA does not 'channel[] incentives and attribut[e] contributions of the individual land owner or territorial unit' (KFW n.d., 6). Information on the location of deforestation informs where to direct revenues, but it is not allocated to or withheld from landholders conditionally, as reward or punishment.

Through this decoupling of land and forest carbon, property and claims to it are rendered almost irrelevant to SISA's day-to-day administration and interactions with rural people, I found. Creating a system that separates carbon's economic value from the geographic location of its storage means there is 'no need...to resolve all pending land tenure issues,' as a flyer explaining SISA boasted (GCF 2012, 2). In traditional private REDD+ projects, forest carbon's financial value accrues to landowners with formal title. In contrast, SISA ties forest carbon's value to what I call 'environmental labor.'

Environmental labor

SISA includes *posseiros* by rewarding labor over land ownership. However, it does not reward all labor. Rather, SISA endows some forms of it with forest carbon's value through the recognition of 'legitimate actions' whose practitioners are 'integrated into' approved programs and projects, according to its founding legislation (GOA 2010, Section III, Art. 4 and 5).

I call these recognized actions 'environmental labor.' The term both connects government-valued actions to the broader analytical category of 'labor' and helps to distinguish them from excluded forms of labor. Labor holds cultural importance as a conveyance of value in Brazil (Wolford 2010a), reflected in some of the terms used to describe poorer and often landless rural Brazilians, including rural workers and family farmers (see Martins 2002; Welsh and Sauer 2015). In Acre, the locally dominant term

'rural producers' particularly foregrounds the importance of labor and the rubber tapper social movement is often understood as a rural labor movement (Martins 2002).

Many types of labor excluded from SISA recognition also might be considered to be environmental. For example, raising cattle, growing crops, and even deforestation are environmental in the sense that they entail human engagement with the 'natural' world. Here, I use the term 'environmental' in a narrower way to indicate labor deemed by the state to protect or regenerate the forest. This form of environmental labor is newly valued in a world concerned with climate change and environmental degradation. SISA makes that broader valuation of environmental labor into a financial one by attaching forest carbon's new monetary value to it. Through this valuation, SISA makes environmental governance into not only a means of governing people (Agarwal 2005; McElwee 2016; West 2006), but also a way for states to direct social assistance to them in the context of neoliberal constraints on more traditional state welfare provision.

Ecosystem services and environmental labor

SISA harnesses the concept of ecosystem services towards multiple ends. It enables forest carbon's commodification through conceptually separating from its ecological context, like other PES projects (Castree 2003; Kosey and Corbera 2010; Robertson 2011). Yet SISA also uses the concept of ecosystem services to shift forest carbon's value from land to environmental labor in a way that reveals—rather than masks—some of the situated social relations of production. This valuation occurs through the conceptualization of a particular figure: the 'provider of ecosystem services.'

The figure of the 'ecosystem service provider' offers a way around the problem of land tenure. As one of SISA's developers described it: 'It is not through the simple fact of owning land that I have the right to earn from [carbon] emissions reductions. I

was not born with that right.¹¹ Rather, he explained, carbon sequestration can be framed as the result of 'human activity that leads to the reduction of emissions in the forest.' SISA's legislation articulates this logic, defining 'ecosystem services providers' based on the 'actions' they undertake (GOA 2010, Section III, Art. 4)—what I am calling environmental labor. SISA recognizes and rewards such actions, endowing them with value of even carbon sequestration that would have occurred 'naturally' without them.

Shifting carbon's value to labor means that landownership is no longer the gatekeeper to accessing forest carbon value. This focus broadens the categories of people who can receive benefits, the SISA developer continued: 'You open up the scenario, because you can have the owners, you can have the extractivist, you can have the guy who just holds land title, you can have indigenous communities. You work on the horizon that has to do with the nature of activities and services. This makes a very big difference.' *Posseiros*, excluded from the institutions of land ownership, could access forest carbon's value based on their environmental labor as 'ecosystem service providers.'

Environmental labor for increased production

The concept of ecosystem services is often connected with the concept of payments, forming the term 'payments for ecosystem services.' Payments can be framed as compensation for forgoing a productive activity, as a SISA administrator explained it: '[P]ayments for ecosystem services are as if...you pay because the person stopped doing a productive activity to conserve that forest area. So you are paying for the opportunity cost they had from stopping the activity where they earned more.'¹² Under a PES

¹¹ Interview August, 2014.

¹² Interview September, 2014.

system, recipients would be paid for forgoing deforestation, in other words.

Alternatively, they might be paid for increased carbon sequestration associated with forest protecting or generating labor, such as monitoring deforestation or planting trees. SISA functions differently. Rather than measuring deforestation or carbon stock in specific tracks of land and offering associate payments, SISA offers 'incentives'—the 'I' in SISA.

The distribution of money from the KFW sales is illustrative. The two KFW contracts require that specified large percentages (70 percent of the first €\$16 million sale and 90 percent of the second €\$9 million sale) of the funding 'directly benefit actors at the local level' (KFW n.d., 6), with the rest of the money going towards SISA's administration. The money is distributed primarily through existing policies and programs via a State Forest Fund and then through government agencies, NGOs, and community organizations. It has benefited 3000 smallholder families, 5283 indigenous people, 6469 rubber tapper families and other forest users, and 2085 farming families. Funded programs support, among other things: agroforestry and agricultural production without the use of fire (e.g., through planting nitrogen fixing legumes), processing and commercialization of sustainably produced crops and forest products, a price mark-up for rubber produced from native trees, and 'sustainable' forms of cattle ranching and fish farming in already cleared areas (ibid, 7).

This distribution points to three relevant aspects of incentives and environmental labor. First, SISA targets and seeks to change rural labor. For example, SISA supports a per kilo subsidy for native rubber production, a declining but historically important form of labor. Funding also supports new forms of labor, like commercial fish farming on already cleared 'degraded' land. Rather than paying for people *not* to deforest or to protect the forest, then, SISA incentives are meant encourage certain forms of rural

labor. A payment is past-oriented, in the understanding of SISA administrators; it is compensation for foregoing labor. An incentive, in contrast, is future oriented, an enticement to adopt new and modified forms of labor.

Second, SISA incentives are generally not conditional on a showing of reduced deforestation or increased carbon sequestration.¹³ There is no measurement of or proxy for ecosystem service provision in exchange for benefits. Instead, incentives might be in the form of a subsidy (e.g., for rubber) or the receipt of something like a fishpond or agricultural training.

Finally, incentives also aim to get Acreanos to produce more, whilst deforesting less, in contrast to the typical correlation of increased deforestation and productivity. Incentives are not given for forest monitoring, reforestation, or other forms of labor that might be seen as directly enhancing forest carbon. Nor is there an effort to separate humans and spaces deemed worthy of protection, through creating protected areas, for example (West, Igoe, and Brockington 2006). In fact, through incentives, SISA seeks to 'intensify' production on both deforested land (approximately 14 percent of the state) and primary forest (approximately 86 percent). The amount of forest would remain stable, the logic goes, while agricultural and forestry production would increase and rural people would accordingly earn more. Conservation is to be achieved through increased production. Several government officials described this approach as a pioneering 'new economic model.' Yet it draws on existing theories of 'land sparing' and the broader valuation of intensive agricultural production in Brazil (Baletti 2014; Oliveira and Hecht 2016; Thaler 2017).

¹³ One funded program does include the kind of conditionality requirement favored by proponents of PES, but my research indicates that, as elsewhere (e.g. McAfee and Shapiro 2010), this requirement was rarely enforced, with participants receiving funds regardless of whether they fulfilled the program's conditions.

In its valuation of some forms of labor through incentives, SISA seeks to change rural livelihood practices, whose reliance on fire to fertilize soils and extensive cattle ranching are faulted for deforestation. This effort aligns SISA with old social theory and long-standing governmental practice that blame smallholders for deforestation and attempt to change their land use practices (e.g., Dove 1983; Li 2007). But it also can be seen as an effort to include them in the vision of a new productive 'low-carbon' economy, as officials often described it. Through building new fishponds, giving nitrogen-fixing legume seeds and fruit tree seedlings, and sponsoring agricultural trainings, for example, SISA seeks to incorporate *posseiros* and others in the project to simultaneously intensify agricultural production and protect the forest.

Redistribution through environmental labor

SISA makes forest carbon into a publicly held resource, rather than a privately held one controlled by those with access to land tenure. Sales of carbon credits enable a form of state redistribution as 'benefits,' as incentives were often called in SISA's day-to-day administration, to rural smallholders. Environmental labor's value to rural people comes not only or even primarily through increased future productivity, as SISA's administrators plan. Rather, environmental labor is valuable because government benefits attach to it. Such benefits constitute an environmentalized expansion of state welfare provision, rather than its reduction so often associated with neoliberal policy.

Labor is made into benefit-construing environmental labor by being recognized by the state government as 'legitimate' and 'integrated' into a state program (GOA 2010, Section III, Art. 4 and 5). Environmental labor is thus made valuable through state recognition and reward. This contrasts but also resonates with more traditional ways that labor has conferred value through wages or other forms of market-based compensation. Environmental labor's value comes not from a wage or crop sale but

through constituting a relationship with the state. Even as fewer people may 'exchange their labor for its market value,' labor may be a way to access the 'distributive allocations' that James Ferguson shows are important to sustaining many people's existence in a world of declining formal employment (2015, 22).

'Benefits,' as SISA incentives are usually described in daily distributive work, do not generally involve the transfer of large sums of money. Rural people were, in fact, critical of their insufficiency (Greenleaf n.d.). Yet, cumulatively with other benefits not premised on land tenure (e.g., *Bolsa Familia* and state pensions), government benefits have become important to sustaining the livelihoods of rural people for whom the state government has been, until recently, largely absent.

Benefits could help make rural life more liveable through the distribution not only of money but of goods and services meant to encourage intensified production. Government fish farming incentives offers an example. In part with KFW support, the state government built thousands of fishponds (4500 in 2011-2014) for free or at a greatly reduced cost for poor rural producers on old pastureland deemed to be degraded. The ponds were part of a larger effort to create a fish farming industry in the state to intensify production on cleared land and to compete with deforestation-linked cattle ranching. However, lack of familiarity with fish farming, the cost of inputs, and the logistics of transportation meant that, at the time of my fieldwork, it was not clear that rural producers would become the type of commercial fish farmers that the government envisioned. However, fishponds were valuable to rural people for another reason: they offered a reliable source of water. Without piped water infrastructure, water shortages could be common during the dry summer months. Rural people might collect rainwater in large blue plastic tubs and those with the means might rig an electric switch-operated pump to bring up water from a downhill stream or river. But for many, when rain was

scarce, water was scarce. In these circumstances, having a fishpond could be life-changing. It filled during the rainy season, and, if properly constructed, retained water through the dry summer heat. It offered a source of water for bathing and for washing clothes and dishes, allowing households to retain rainwater for drinking and cooking.

The government built fishponds primarily to spur fish farming. In so doing, they also brought needed water to rural producers who had never received this kind of government service. Forest carbon's new value enabled certain kinds of social welfare provision, with environmental labor acting as conveyance of government redistribution.

Conclusion

Climate change and responses to it tend to disproportionately harm poorer people. But new attendant forms of environmental value, such as the value of forest carbon, can also enable new forms and levels of state social welfare provision premised on environmental goals. In Acre, this redistribution occurs through shifting forest carbon's value from land ownership to environmental labor.

Giving the state the power to determine what counts as the type of labor to which forest carbon's value should attach engenders its own forms of rural politics and exclusions (Greenleaf n.d.). Yet moving away from land rights may enable more just outcomes in places where formal property has been exclusionary, like Brazil, where land ownership has been the basis of massive and sustained inequality in Acre and Brazil more generally. Land is not the only possible or even preferable basis for rights and more secure forms of inclusion, as the concept of environmental labor suggests.

Yet in Acre and many other places, land and rights to it retain tremendous social importance that benefits for environmental labor do not eliminate. Land remains relevant for a few reasons. First, it directly mediates material well-being. Land can determine access to resources (Ribot and Peluso 2003) and can act as a reliable base

from which to access governmental and other non-wage and agricultural-based support (Ferguson 2013). Rural people I knew pursued land titles for diverse reasons: to claim and sell resources, access to bank financing, counter competing or anticipated claims, to increase land value for future sale, and to create an affordable place for retirement and family gathering. Moreover, land and its ownership are central to active processes of land grabbing and agro-industrial expansion (e.g., Borras et al. 2011), fueling efforts to control it.

Second, land also retains significant cultural and political power as a source of identity and inclusion in Brazilian society, even in places, like Acre, where it has been primarily a means to secure relationships, power, and livelihoods (see Wolford 2010a). As Jeremy Campbell found, 'In Amazonia, the allure of property lies not only in controlling and potentially profiting from the land but also in land's status as a historical threshold that promises participation in a broader political economy' (2015, 198). Land has political value as the basis for claiming and receiving other rights that uncertain government benefits do not necessarily convey (Morton 2015). Pursuing property was what many *posseiros* did to try to constitute themselves as rights-bearing Brazilians citizens.

Moreover, labor has been essential in this pursuit of land, binding the two together. Versions of a labor theory of property, in which labor construes property rights (Locke [1689] 1980), are influential in many countries, but the theory may be particularly salient in places with histories of confusion around property rights, such as Brazil (see Wolford 2010a). Without clear alternatives, labor has been a particularly important means to claim land, with land usage and laborious forms of demarcation

considered essential components of land claims (e.g., Campbell 2015).¹⁴ Even as SISA tried to avoid the morass of land through emphasizing labor, the historically constituted link between them mean that land and rights to it remain salient, something for which rural people struggle.

Environmental labor might be enlisted in these ongoing struggles for rights to land and, more broadly, 'the right to rights' that land has represented (Holston 2008). Just as the labor of deforestation has in the past constituted the most effective evidence of 'productive use' used to make land claims (Araujo et al. 2009), environmental labor meant to reduce deforestation might now constitute land rights-conferring labor. Labor movements, which have long struggled for land in Brazil (e.g., Pahnke, Tarlau, and Wolford 2015; Welsh and Sauer 2015; Wolford 2010a), could use environmental labor as another impetus for agitating for land rights.

But environmental labor could also enable more common and less organized quotidian efforts to access land rights, like those are commonly practiced by *posseiros*. Environmental labor may be used not only as evidence of productive land use needed to maintain land claims (see Osborne 2011), but also of state recognition of those claims. Benefits for environmental labor—the building of a fishpond or the receipt of a rubber subsidy payment, for example—could be seen to constitute a form of state recognition of the beneficiary's right to the land on which they labor, another piece of evidence enlisted to claim rights to land. Even when insufficient to obtain formal land tenure, such evidence may make rural people's land claims less easily dismissed and therefore more secure. Especially when the size of the benefits received is relatively small, the evidentiary value of the benefit in the pursuit of land rights may be greater than the

¹⁴ Exclusion from formal property rights has also generated labor by creating large numbers of landless people to serve as rural and urban labor (Martins 2002, Holston 2008).

value of the benefit itself, monetary or hydrological. Land rights, in other words, might be an outcome of the new environmental value's attachment to labor, rather than the means for accessing it.

Many in Acre's environmental elite would likely welcome more secure land rights for SISA beneficiaries, both because of their connections to Acre's social movement and their training in environmental thinking that values land tenure. But without more systematic redistributive land reform, that increased security may always be precarious, the patchy result of the hard-won struggles of social movements and individuals. In this, SISA's effort to avoid land rights and their exclusions aligns it with a long history of governmental avoidance of redistributive land reform in favor of less politically challenging forms of redistribution. New forms of environmental value can enable state social welfare provision, but whether this environmentalized redistribution supports more inclusive and just societies remains to be seen.

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