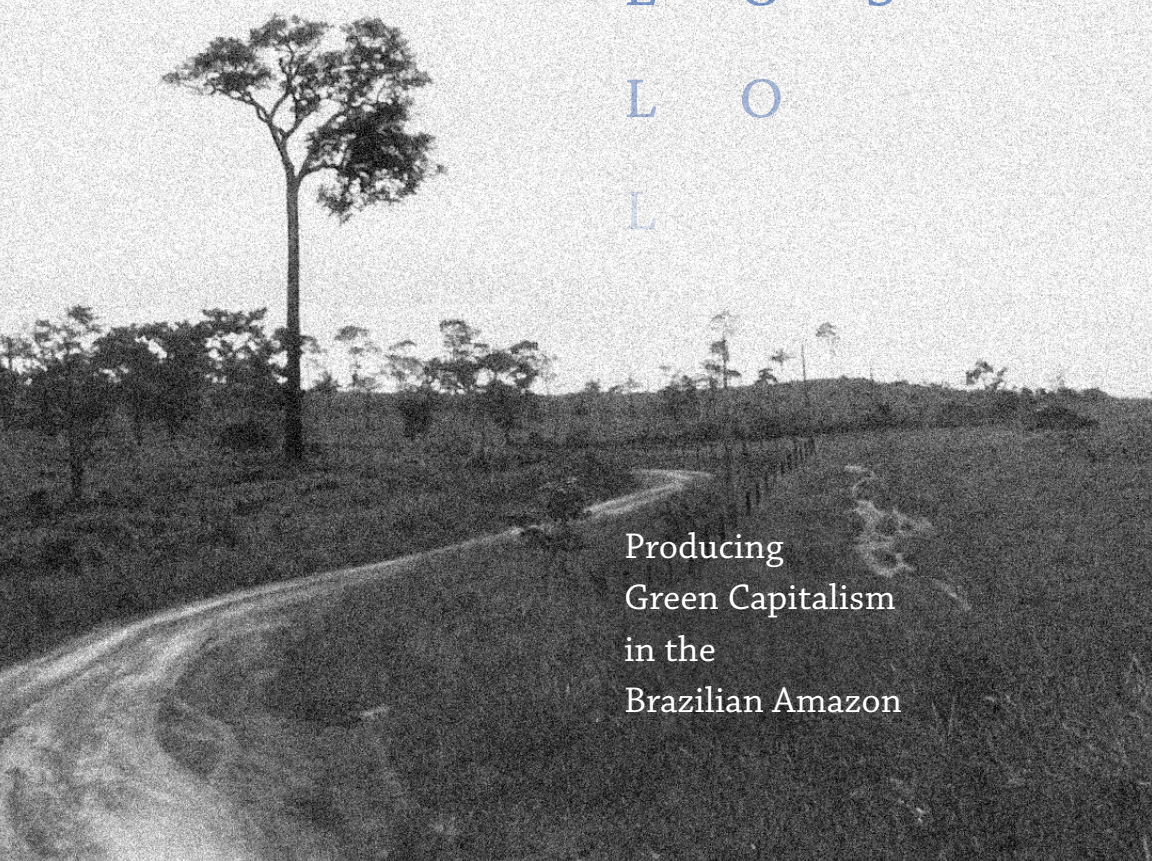
FOREST LOST

Maron E. Greenleaf



Producing
Green Capitalism
in the
Brazilian Amazon

Forest Lost

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Producing Green Capitalism in the Brazilian Amazon

MARON E. GREENLEAF

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To Hal and Etta, who remade my world.
I hope this book helps make yours a bit better.

CONTENTS

ABBREVIATIONS

BAU	Business as usual
CARB	California Air Resources Board
CBNRM	Community-based natural resource management
CCBA	Climate, Community and Biodiversity Alliance
CIFOR	Center for International Forestry Research
CIMI	Conselho Indigenista Missionário (Indigenous Missionary Council)
CO_2e	Carbon dioxide equivalent
GCF Task Force	Governors' Climate and Forest Task Force
GDP	Gross domestic product
GHG	Greenhouse gas
IMC	Instituto de Mudanças Climáticas e Serviços Ambientais (Institute for Climate Change and Environmental Services [Acre])
INPE	Instituto Nacional de Pesquisas Espaciais (National Institute for Space Research)
IPAM	Instituto de Pesquisa Ambiental da Amazônia (Amazonian Environmental Research Institute)

MOU	Memorandum of understanding
MST	Movimento dos Trabalhadores Rurais Sem Terra (Landless Workers' Movement)
NGO	Nongovernmental organization
NTFP	Non-timber forest product
PES	Payment for ecosystem services
PPCD	Plano Estadual de Prevenção e Controle de Desmatamento no Acre (State Plan for the Prevention and Control of Deforestation of Acre)
PT	Partido dos Trabalhadores (Workers' Party)
REDD+	Reductions in emissions from deforestation and forest degradation
REM	REDD Early Movers
Rio+20	United Nations Conference on Sustainable Development (2012)
SEAPROF	Secretaria de Extensão Agroflorestal e Produção Familiar (Secretariat of Agroforestry Extension and Family Production [Acre])
SISA	O Sistema de Incentivos a Serviços Ambientais (the System of Incentives for Environmental Services [Acre])
tCO_2e	Tons of carbon dioxide equivalent
TFS	Tropical Forest Standard (California)
UFAC	*Universidade Federal do Acre*, Federal University of Acre
UNFCCC	United Nations Framework Convention on Climate Change
ZEE	Zoneamento ecológico-econômico (ecological-economic zoning)

PREFACE

Green Capitalism

The climate is changing in ways that demand significant and immediate response. Efforts to address climate change, however, cannot target the climate directly. Instead, they must work through the myriad environmental, economic, infrastructural, political, cultural, and multispecies dynamics that have caused climate change and the associated climate crisis.[1] In this, such climate solutions necessarily impact much more than the climate itself. Yet it can be easy to ignore these impacts, particularly in places that seem distant from us—places, perhaps, like the Brazilian Amazon, which is the focus of this book. But we *should* pay attention. Efforts to address climate change are increasingly important in everyday life, reshaping people's relationships with each other, other species, the state and other institutions, and the landscapes in which they live. And these relationships are also critical to the efficacy of climate solutions themselves.

Until recently, at least, climate change itself has also been relatively hard for most of us to pay attention to, and therefore to think about, write about, care about, study, and address.[2] This is in part because some climate impacts can be slow-moving, and because of the steady drip, drip, drip of greenhouse gas (GHG) emissions, year after year.[3] Understandably, the significant and mundane joys and struggles of daily life can make it hard to pay attention to more subtle climate impacts, especially for those usually insulated from their front lines.[4] Among these impacts is the way that climate change is

making it harder for the rainforest in the Brazilian Amazon to survive and regenerate day-to-day, even where no one is cutting or burning it. The rainforest may soon reach a "tipping point," scientists warn, in which significant portions of it give way to grassy savanna. The consequences for the climate—not to mention for local ecosystems, humans, and other species—are dire.[5]

Climate change, though, is becoming increasingly obvious in many people's day-to-day lives, including my own. As I write these words in spring 2023, particulates from burning Western Canadian forests move through the altitudes high above me, thousands of miles away on the East Coast of the United States. I sense them in both vibrant sunsets and dulling midday haze. Just a few weeks later, smoke originating from nearby Eastern Canadian fires pollutes not just the air aloft but also the air near the ground that my children and I breathe. A few weeks after that, the neighboring state of Vermont floods, owing to exceptional rainfall. These fires and floods are notable not because they are exceptional, but because, increasingly, they are not. On almost any given day, I could write about a fire or flood (or heat wave or storm or drought) happening, if not close by, then somewhere not too far away—somewhere connected to me by atmosphere or affect. For an increasing number of people, addressing the climate crisis feels urgent and personal.

But what do efforts to address the climate crisis actually entail, and what do they do in everyday life? In this book, I explore this question by examining a preeminent contemporary climate solution: making living forests and the carbon they sequester monetarily valuable. This so-called nature-based solution was widespread during the time in which I researched and wrote this book. I examine it as a form of "green capitalism": the use of capitalist logics, forms, and practices—such as those of monetization and markets—to address the climate crisis and other forms of environmental degradation.[6]

Green capitalism has been the dominant climate mitigation strategy of what I have come to think of as "early climate change"—a term that David McDermott Hughes used in a 2023 talk I attended.[7] Like the terms *late industrialism* and *late capitalism*, early climate change helps me to think beyond the present. It lets me see that this current moment does not encapsulate all that climate change will be, that what it means and how we relate with it will also change, that we are at a beginning. I have come to understand early climate change as a period of uncertain duration when many people with some degree of power or privilege (derived, in part, from the burning of fossil fuels) approached climate change as a market failure that could be fixed with some elegant, internal, and even profitable tinkering. I first

encountered versions of this alluring idea in the 2000s while in law school (largely a schooling in systems that maintain that power and privilege): if we could just tax carbon emissions or make corporations trade those emissions or pay for the prevention of those emissions in landscapes like the Brazilian Amazon, then we could solve climate change in ways that would simultaneously shore up the economy, but without fundamentally changing it.

That such iterations of green capitalism have not worked as planned—as I explore in this book—does not mean they can be easily dismissed as just the latest accumulation strategy or form of corporate greenwashing. Instead, ethnographically examining them as often genuine and culturally and materially meaningful efforts to address the climate crisis may be a way to understand this period of early climate change, in all its patchy unevenness and inequity.[8] Perhaps some years from now, during what might be known as middle or late climate change, someone may thumb through a dusty, surviving copy of this book, or scroll through its text on their screen, or download their AI assistant's summary of it as an account of a seemingly distant and perhaps naïve past when some people thought they could fix climate change simply by using the logics and practices that have been its primary cause.

ACKNOWLEDGMENTS

Like a tree, a book can seem singular. It appears to exist on its own, bound within its covers. As I explore, though, neither trees (nor forests nor the carbon that they store) actually do exist on their own. Rather, they exist through complex social and environmental relations. So too do books, including this one. *Forest Lost* would not exist without many people who have been part of my life through the researching and writing of this book, in ways large and small. This is my opportunity to name some of them. All faults, of course, are mine alone.

First, I want to thank those I met in Acre for their generosity, patience, and openness. The friendships of Hamilton Araújo, Mara Braga, Fronika de Wit, George Dobré, Ronizia Goncalves, Ana Paula Kanoppa, Souza Oliveira, Leo Ribeiro, Kaline Rossi, and Gabriela Severino were particularly important in helping me to understand Acre and its forests, and in offering support and companionship when I was there. My deep thanks to the staff of the Institute for Climate Change (particularly Monica de los Rios, Pavel Jezek, and Magaly Medeiros) and of the Secretariat for Agroforestry Extension and Family Production (particularly Ronei Santana) for enabling me to spend time at their institutions. In Feijó, I especially want to thank the people I refer to here as Luis, Flávia, and Manuel, who let me stay in their homes and get to know their families. I am grateful for their generosity and hospitality. Other institutions and people in them

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Forest Lost has also benefited from a number of editors, reviewers, and others in the publishing world. Earlier in the process, Megan Pugh's editing helped to improve the text. More recently, working with Duke University Press has been a wonderful experience. Thank you to my editor, Gisela Fosado, for the encouragement and good advice throughout the process, to Alejandra Mejía for addressing all my many questions along the way, and to two anonymous reviewers, whose comments and suggestions helped make this book so much better. The excellent copyeditors and production team were also key players in transforming *Forest Lost* from a manuscript to a book.

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Introduction

At the United Nations' (UN) climate conference in 2007,[1] Norway's Prime Minister Jens Stoltenberg articulated a simple idea that had been circulating for a few years in international policy circles: "Through effective measures against deforestation we can achieve large cuts in greenhouse gas emissions—quickly and at low cost. The technology is well known and has been available for thousands of years. Everybody knows how not to cut down a tree."[2]

This idea has proved to be attractive and influential, and it has shaped climate mitigation and conservation around the globe.[3] It is often known by the acronym REDD+, which stands for "reductions in emissions from deforestation and forest degradation." Since the early to mid-2000s, there have been extensive REDD+ and related efforts to commodify or otherwise

monetize reductions in GHG emissions from forests, particularly tropical ones. In carbon markets and other market-based mitigation schemes and practices, polluters may seek to "offset" their own emissions or otherwise monetarily compensate tropical forest regions for forgoing deforestation.[4] Through this monetization, the carbon sequestered in many forests—or forest carbon—can come to have monetary value itself, or at least the potential of it. This effort to make forest carbon monetarily valuable is a key part of contemporary green capitalism—efforts to use capitalist logics, forms, and practices to mitigate environmental damage.

In the years after the 2007 UN conference where Stoltenberg spoke, green capitalism seemed to pervade discussions about the climate and other environmental issues. It was central, for example, to the 2012 Earth Summit in Rio de Janeiro (Rio+20). The first Earth Summit, hosted in the city twenty years earlier, had not only articulated growing alarm about climate change. It had also urgently spotlighted the extensive Amazonian deforestation occurring at the time, deforestation rendered visible by Brazil's innovative new remote sensing–based deforestation monitoring system.[5] But at Rio+20, things seemed different. There was some optimism in the air, in part because Brazil seemed to have "decoupled" Amazonian deforestation and agribusiness-linked economic growth, which had been long understood as inextricably linked.[6] Deforestation in the Amazon had dropped dramatically since the mid-2000s even as the region's gross domestic product (GDP) grew and poverty declined. Preeminent scientists envisioned the end of illegal deforestation in the region, and there were claims that Brazil had done more than any other country in the world to address climate change by reducing Amazonian deforestation.[7] Building on this momentum, many people in the public and private sectors were working to give monetary value to the approximately 100 billion metric tons of carbon estimated to be sequestered in the Amazon forest.[8] Rio+20 was abuzz.

At the conference, officials from Acre—a small and relatively poor Amazonian state located in Brazil's far west on the border with Peru and Bolivia—offered the state as a prime example of this Amazonian environmental and economic success. Deforestation in Acre was down some 80 percent since its 2005 peak, social development indicators were up, the economy was growing, and the state had an ensconced left-of-center government known for prioritizing forest conservation. Speaking alongside other Amazonian governors at an International Forest Day celebration at Rio+20 that I attended, Acrean governor Tião Viana spoke to a crowded hall about how the state's environmental leadership had put Acre "ahead of all the states"

in the Brazilian Amazon. Acre had achieved higher economic growth and lower deforestation by breaking the dominant deforestation-linked cattle "paradigm" and making the state's timber industry "sustainable." He then positioned the state's new forest carbon program as the latest element of this successful effort. That program was the leading component of SISA—the state's System of Incentives for Environmental Services, adopted into state law in 2010.

Viana was not alone. In the early 2010s, SISA received international praise for creating one of the world's most advanced REDD+ programs.[9] The new law advanced the state's international reputation as "a global pioneer in forest protection," as one outside funding institution put it.[10] Through SISA, the Acrean government could sell forest carbon credits (representing reductions or removals in GHG emissions), receive payments for emissions reductions, and otherwise pursue monetary compensation for protecting the rainforest.[11] At the time, Acre seemed poised to sell forest carbon credits as offsets in the state of California's prominent carbon market—which would have been an important first for REDD+—as well as to other buyers. In 2012 and 2013–2014, I studied SISA and related efforts in Acre to understand how green capitalism was being enacted there—how reductions in Acrean forest carbon emissions were being commodified and otherwise monetarily valued, and the social and political effects of doing so.

This book offers an ethnographic account of what I found.[12] In conversations, meetings, and documents, my interlocutors in the Acrean government and allied NGOs often described their work to make the forest valuable as "valorizing" (*valorizar*) the forest—not the dead forest that is so often valued in the form of timber or cleared space, but the living one (*a floresta em pé*) that traditionally has been accorded little monetary worth. This valorization was both monetary and cultural—forms of value that they saw not as in competition, but rather more like David Graeber's description of them as "refractions of the same thing."[13] Additionally, this valorization sought to link forest protection and rural development—to improve the well-being of rural people and create a legibly productive rural economy in ways that relied on forest conservation rather than forest destruction.[14] My study of SISA involved spending time in government and NGO offices and with the people who worked in them in Acrean cities, as well as with the smallholders they were trying to entice to forgo deforestation in rural areas. In this book, I trace many of the material, governmental, and multispecies relations I encountered—relations that undergirded this effort to make forest carbon valuable.

When I started researching the valorization of the Acrean forest and its carbon, I anticipated studying things like forest carbon's standardization, privatization, and sale in new carbon markets. This orientation was based both on training I received as a student in law school and on some critical scholarship about neoliberal environmentalism that I had encountered in my PhD program in anthropology. I imagined tracing how these processes simplified landscapes and excluded smallholders, nonforest species and land uses, and tree species that did not maximize carbon sequestration. Yet what I found was, in some ways, different than what I expected.

In this book, I show how, contrary to my expectations, forest carbon's valorization engendered an environmentally premised welfare state and environmentally negotiated citizenship, instead of the type of market relations I was expecting. Rather than making forest carbon into private property, that state made it into a form of public property and wealth, much of which it redistributed as benefits to forest beneficiaries. Rather than another uniform monocrop, forest carbon appeared more like a multicrop—one made indirectly through the production of other forest and field-based products. Rather than gaining value as a form of generic, standardized carbon, Acrean forest carbon appeared valuable because of its singularity. Rather than exclusively centering the forest's monetary value, the Acrean state paired it with efforts to make the forest culturally valuable. These dynamics and the relations entangled in them were different than the paradigmatic forms of neoliberal dispossession and simplification I expected to encounter. Yet they were no less uneven, contingent, and contested. I trace these relations—both their negotiations and tensions—in the pages that follow. In so doing, I also elucidate broader efforts to create capitalist processes suited to this era often called the Anthropocene, and those efforts' alluring promises and vexing failures.[15]

Green Capitalism in Tropical Forests

By the time I arrived in Acre in 2012, green capitalism had been touted as a solution to the climate crisis and deforestation for some time. Market-linked environmental programs had become increasingly central to what Hannah Appel calls the "project" of capitalism, because of both the threat to continued accumulation that environmental degradation poses and the potential for profit that working to address it promises.[16] Green capitalism seeks to "internalize externalities," address the "market failure" of climate change, "pay for ecosystem services" (PES), and enable corporations and

other institutions to claim carbon neutrality ("net zero"). Doing all this promises to change the relationship between capitalist economies and the environment, incorporating ecosystems as monetarily valuable components of those economies, rather than just "cheap nature" to be exploited.[17] Tropical forests have been key to this vision because they are important stores and sources of carbon and have long been imagined as sites of underutilized value more generally.

Belying liberal tropes about the "free market," green capitalism has not emerged on its own. Like other forms of capitalism, the state and law have been important to its variegated development.[18] I started learning about the entanglement of law, economics, and environmental markets while in law school around the same time as the 2007 UN conference. At the law school I attended, at least, studying environmental law often entailed studying economics. I learned about environmental harms as "externalities" that could be addressed through property rights and trading mechanisms.[19] I learned that pricing harm and cost-benefit analysis could create better environmental regulations. And I learned about market-mechanisms, offsets, and taxes as legal tools that could efficiently address environmental harm and overcome the inefficiencies of more traditional *command and control* regulations. Economic theory may shape the world, but it entails a lot of legal work and education to do so.[20]

My legal training was in keeping with the neoliberal environmentalism of that time. Even as economies reeled through the 2007–2008 financial crisis, the 2009 UN climate negotiations floundered, and the US Senate abandoned carbon market climate legislation in 2010, carbon market programs and their offset programs proliferated through the UN's Kyoto Protocol, voluntary offset purchases, and national and subnational programs. This latter category includes cap-and-trade programs, also known as compliance carbon markets. They are government programs that require specified types of polluters to obtain allowances or permits to emit GHGs, with the allowances adding up to an overall cap that is ramped down over time to an emissions level deemed to be acceptable.

Key to these programs is an understanding of the climate that I learned in law school: that it does not matter *where* GHGs are emitted or reduced because their climatic impact is the same. Emissions reductions and removals therefore should occur wherever they are cheapest. Carbon offsets and credits are meant to enable this economic efficiency.[21] In compliance carbon markets, regulated polluters can obtain allowances (essentially permits to pollute) from governments. If they reduce GHG emissions or remove

GHGs from the atmosphere, polluters can also generate and trade carbon credits within carbon markets. In addition, depending on a carbon market's rules, polluters can purchase generally lower-cost carbon offsets from outside of the regulatory cap to cover some percentage of their emissions.[22] These offsets represent GHG emissions reductions or removals, sometimes geographically far removed from the compliance carbon market itself. As I explore in chapter 1, to generate credits or offsets, an entity (for example, a business, government, NGO, or individual) sets a reference level rate of GHG emissions. The reference level is a seemingly technical counterfactual projection of the emissions that *would have happened* in the absence of a decision or effort to reduce emissions—often a projection of *business-as-usual* (BAU).[23] If the measured emissions rate is lower than the reference level (or a lower baseline rate), the difference between them might be sold as carbon credits or as offsets to outside polluters—quantifications and sales that are mediated by other institutions including regulators, auditors, and certifiers. Each generally represents a ton of carbon dioxide equivalent (tCO_2e). Such programs seem to make GHG emission reductions and removals standardized and fungible. In the process, carbon itself can seem like a new global commodity. As the UN explains about its emissions trading program, "A new commodity was created in the form of emission reductions and removals. Since carbon dioxide is the principal greenhouse gas, people speak simply of trading in carbon. Carbon is now tracked and traded like any other commodity."[24]

The alluring potential that forest carbon would soon be integrated into compliance markets as offsets—and the simple logic of their economic efficiency—spurred and shaped REDD+'s development in the late 2000s and early 2010s. In anticipation of market money flowing, many REDD+ initiatives were started in tropical forests around the world, creating what Rob Fletcher and coauthors call "an economy of expectations."[25] As they waited for that money to arrive, some in tropical forests sought to access funding by selling offsets in the so-called voluntary market, in which businesses and individuals buy offsets voluntarily in what they frame as compensation for their own emissions. New institutions, organizations, businesses, and research projects (including my own) proliferated, and old ones were repurposed to include this latest conservation trend. "Carbon cowboys" looked to cash in,[26] businesses saw the potential for profit, and many committed environmentalists—who had worked for years to protect forests with limited funding—were sold on carbon's commodification as a way to bring significant money into forest conservation. As with other tropical forest

resources, the "myth of profit," as Bolivian sociologist René Zavaletta put it, was powerful; the "culture of miracles" described by Venezuelan playwright José Ignacio Cabrujas was strong.[27] The pursuit of forest carbon's value could be as tantalizing, and illusory, as El Dorado—the mythical Amazonian city of gold that seemed to be, somehow, always just around the next river bend.

There was also some nonmarket REDD+ funding, often portrayed as a stopgap until market funding arrived. This funding could also monetarily valorize forest carbon. Some of it came through familiar channels: foreign aid, development lending, and conservation funding. Often, well-known development and conservation institutions were powerful players. For example, the World Bank, through its new Forest Carbon Partnership Facility, offered funding to get tropical forest regions REDD+ "ready" for the carbon market envisioned to come.[28] Some money came through new programs that paid for emissions reductions or ecosystem services. In Brazil, the federal government established the Amazon Fund in 2008, into which other countries (Norway most prominently) paid for reductions in Amazonian forest emissions.[29] In Acre, the most important source of nonmarket funding during the early to mid-2010s came from the German development bank KfW. Through the REDD+ Early Movers Programme (REM) that was launched at Rio+20, KfW paid the Acrean government €25 million in "payments for emissions reductions" for the years 2011–2015—paid at US$5/ton of avoided emissions across two contracts.[30] Acre was REM's first recipient. Acrean government interlocutors characterized these payments to me as more akin to donations than market transactions, since the emissions reductions were not traded, nor were they were meant to compensate for German emissions. Yet the distinction between gift and commodity is not so definitive.[31] The payments monetized emissions reductions and signaled the quality of Acrean forest carbon, and the socioenvironmental relations keeping it sequestered, for potential carbon credit buyers to come. At a government meeting that I attended, one SISA administrator explained to her colleagues that she hoped that the KfW contracts would be "tools" to advance REDD+ nationally and internationally. "We want to show that this works," that the payments could be "channeled" well, benefiting those on the ground so they could, in turn, provide more emissions reductions. That was their "commitment." In this, the KfW payments made forest carbon valuable even in the absence of carbon trading. They were meant to prime Acre for the anticipated offset sales to come.

Green capitalism expanded as I was writing this book at the end of the 2010s and early 2020s. Concepts such as natural capital, ecosystem

services, and nature-based solutions are increasingly mainstream and value-producing.[32] Renewable energy, ecotourism, and sustainability are big business. As the CEO of BlackRock, the world's largest investment firm, put it in his 2021 annual letter to other CEOs, "The climate transition presents a historic investment opportunity."[33] His 2022 letter was titled "The Power of Capitalism" and touts US$4 trillion in "sustainable investments" in the global economy.[34]

Tropical forests continued to be enmeshed in green capitalism, though not always in the ways imagined during my fieldwork. REDD+ initiatives did not become part of regional compliance carbon markets or a global one in the 2010s. Some scholars and conservation practitioners said that REDD+ was just the latest conservation "fad" to fade or that "REDD+ is dead," while others argued that it had never really been born.[35] At the same time, deforestation increased substantially in the Amazon in the late 2010s, around the presidential election of the right-wing politician Jair Bolsonaro and then with support from him and other agribusiness-linked politicians.[36] This occurred in Acre too, where deforestation increased substantially during that time. Acrean voters supported Bolsonaro and allied candidates in 2018 and 2022, and no state forest carbon offsets were sold.

Yet green capitalism, and the role of tropical forests in it, only grew in the late 2010s and early 2020s—a period of increased corporate commitments to "carbon neutrality" via voluntary forest carbon offset purchases,[37] new financial technologies such as forest bonds, prominent pledges of tens of billions of dollars to combat tropical deforestation, and the potential to access even more funding via new pathways for selling forest carbon credits and offsets.[38] This period saw the creation of new organizations like Emergent, an NGO described on its website as an "intermediary acting between tropical forest countries and the private sector" to "creat[e] a new marketplace in large-scale transactions of high-integrity carbon credits at the jurisdictional scale."[39] Echoing Stoltenberg's 2007 speech, Emergent posits that "reducing tropical deforestation is the largest near-term natural climate solution and one of the most cost-effective, gigaton-scale opportunities to reduce emissions over the coming decades." Even Bolsonaro tried to cash in, demanding a billion dollars to reduce Amazonian deforestation and "fair payment for ecosystem services."[40] His government positioned Brazil as a carbon offset exporter, committed to ending illegal deforestation by 2028, and adopted a bill to pay rural people for environmental services.[41] Meanwhile, related green capitalist efforts at *low-carbon rural development* continued in many tropical forest regions, including in Acre through SISA.[42]

Through green capitalism's expansion, then, carbon—usually only monetarily valued when extracted to create energy from fossil fuels—appeared to now have value generated from staying put in tropical forests. The latter value is meant to counter the climatic harm of the former. Monetarily valuing carbon in this way tantalizingly promises to "civilize" markets, as Michel Callon envisioned.[43] It promises the fulfillment of not only the usual goals of profit maximization and economic growth, but new ones too—climate mitigation among them.

There are good reasons to be critical of this promise—reasons that have been articulated by Indigenous and other forest activists and critical scholars, including some in Acre.[44] They include critiques about the veracity of forest emissions reductions,[45] the fungibility of these reductions with fossil fuel emissions, and the simplifications entailed in commodification—with concerns about forests being managed to maximize carbon sequestration above all else. More fundamentally, carbon credits and especially offsets have been understood as part of a neoliberal environmentalism and a wily iteration of capitalism that extracts value to address the very harms that it causes—harms which are unequally borne and perpetuate environmental injustices in frontline communities, including where fossil fuels are extracted, processed, transported, and burned.[46] In this, there is concern about REDD+ being premised upon, and reinforcing, global inequity—a kind of green colonialism or "green grabbing" in which wealthy polluters in the Global North pay poorer communities in the Global South to absorb their emissions, and at a low price that is based on ongoing colonial relations.[47] Forest carbon can thus appear as another exploited resource of the Global South, one that can facilitate "accumulation by dispossession," dividing and harming Indigenous and other forest communities.[48] Packaged as carbon offsets, reducing forest emissions in the Amazon promises to prop up the continued burning of fossil fuels elsewhere, primarily in the Global North. In this sense, forest carbon as commodity extends extractive, colonial, and racialized capitalist dynamics.[49]

This book does not dispute these accounts, but its emphasis is different. Green capitalism has expanded, I found, but incompletely and in ways that can consequentially diverge from neoliberal doctrine and some critical accounts of it. Approaching capitalism as constructed and yet potent, I explore the contingent and relational work that underpinned Acre's prominent effort to valorize the forest and its carbon via an environmentally premised welfare state, and how such efforts do not always proceed as planned. In doing so, I build on feminist anthropological work on capitalism as "produced,"

as Sylvia Yanagisako puts it—as powerful and yet not comprehensive, and as composed of often gendered and racialized processes that can shape the world but require a lot of work to do so.[50] In the case of green capitalism, at least, these processes are not always so all-encompassing as our stories (both critical and supportive) often make them out to be. Rather than coherent or standardized, green capitalism in Acre was fragile. It was an incomplete experiment whose "achievement" was elusive and contested,[51] and one that could rely upon and reproduce dynamics it sought to counteract. At times, green capitalism seemed to barely exist, and yet it also shaped lives and landscapes in the Acrean Amazon.

Following Forest Carbon and Producing Nothing

I started off my research by trying to study forest carbon offsets in a manner that critical scholars have often studied commodities—to "follow" them from production to purchase.[52] But I found forest carbon to be quite elusive. When I brought it up in discussions, interactions, and interviews, or when the term was introduced in workshops, meetings, or events that I attended, it tended to quickly recede from the conversation. I was in Acre to study what was arguably the world's most prominent effort to make forest carbon monetarily valuable, and yet forest carbon itself was difficult to hold in focus. It was difficult to follow.

This elusiveness points to the strangeness of forest carbon as a would-be commodity. It is worth dwelling on this strangeness for a moment—to be curious about how forest carbon is valorized and commodified, and what understanding the process can help us to fathom about this moment in early climate change. Unlike many of the things we buy, forest carbon is not something you can hold, wear, eat, sit on, listen to, or display. Other than documents, there is nothing to see—not to mention hear, smell, taste, or touch.[53] Moreover, its value comes not from being removed and traded but rather from reductions in its emissions, often referred to as emissions reductions. For example, through SISA and working with other institutions, the Acrean state could sell forest carbon offsets or otherwise receive payments for emissions reductions, compared to a BAU forest emissions rate (the reference level referred to earlier).[54] In other words, it is not forest carbon's extraction or circulation that generates monetary value, in contrast to many other commodities. Rather, forest carbon's value comes from carbon staying in place, from a tree not being cut down, as Stoltenberg put it. There

is, then, no rupture into independent being, nothing tangible that readily appears to hold or create value. Instead, what creates value is a reduction, an absence, an action not taken. Offsets, payments for emissions reductions, and other carbon credits entail producing nothing to balance the too-many somethings made. Producing nothing was REDD+'s great value proposition in the effort to enlist capitalism to combat the climate crisis and other environmental harms of the Anthropocene.

But how do you produce nothing? It might seem that it would entail doing nothing, perhaps paying people not to deforest. Indeed, this is frequently how REDD+ has been discussed, as Stoltenberg's speech indicates. After all, trees and other plants need no help in absorbing carbon. They build their bodies with carbon via photosynthesis and absorb billions of tons of it from the atmosphere without any human say-so.[55] Stoltenberg's elegant logic follows from this: REDD+ should be an easy and cheap way to reduce carbon emissions because everyone knows how not to cut down a tree.[56] Leave it alone, and it will help to address the climate crisis itself.[57] Yet forests are not just trees, and when they are exploited or threatened—as they are in Acre and many other places—doing nothing seldom leads to their protection.[58] Instead, deforestation is increasingly the norm. Deforestation accounts for approximately 16 percent of yearly global GHG emissions, and some tropical forests may now emit more carbon than they store.[59]

There are different ways to understand this widespread and consequential deforestation. It is partly a consequence of the integration of forests into global capitalist supply chains and of their resulting monetary value when destroyed for timber or to make space for infrastructure, occupation, monocrops, and cattle. Yet there are also other connected dynamics at work: Since forests are notoriously hard to govern—serving, for example, as places to evade domination—deforestation can be a strategy of state control and colonization.[60] Relatedly, in places like Brazil, where deforestation has historically indexed progress, it can be a way to claim land, citizenship, power, and belonging.[61] Consider what the leader of a "land grabbing gang" told reporters in 2014, after he was fined for extensive illegal deforestation in the Amazonian state of Pará, far to Acre's east: "I regret doing something illegal, but I don't regret having deforested because if we didn't deforest, Brazil wouldn't exist, nothing would exist."[62] Modern existence itself, he asserted, depends upon felling the forest.

Not cutting down forests is, therefore, not so much a question of knowledge, as Stoltenberg positioned it. Rather, those who deforest may feel they

have no other option if they are to survive. This was how smallholders in Acre frequently put it to me. They deforested for the money, security, status, and sense of belonging that doing so can bring in the Brazilian Amazon.[63] In this, deforestation has less to do with individual decision-making or knowledge than with large-scale colonial and capitalist processes in which smallholders are frequently enlisted—processes that value deforestation and shape things like knowledge, the perception of choice, and deeply felt desires.

In threatened forests, then, producing nothing requires a lot of work to avoid the deforestation that has been the main way to make forested places monetarily and culturally valuable. Significant critical scholarship has elucidated some of that work, focusing particularly on the measurement, calculation, and other forms of standardization that are essential to creating new carbon commodities and enabling them to move through markets.[64] As Donald MacKenzie puts it, this work makes different GHG emissions appear the "same" via the common metric of tCO_2e.[65] Through such standardization, carbon can come to appear like a fungible and valuable commodity—an offset, for example. Carbon's standardization can enable it to take on other roles as well: it can act as a "common denominator for thinking about the organization of social life in relation to the environment," a "metric of the human," and a "universal standard" that "enables comparability and even commensurability between different forms of life and different actions across spheres."[66] In this, carbon's standardization is important to making forest carbon valuable, monetarily and otherwise.[67]

Yet forest carbon's valorization also depends on producing nothing from places like Acrean forests. And producing nothing involves a different kind of work that is not about standardization: protecting forests. This second kind of work is necessary because it is carbon's state of being—rather than simply its existence—that is of climatic relevance. Carbon's existence, after all, is not the cause of the climate crisis. Rather, carbon—created as distant stars die out—is one of the most common and oldest elements in the universe.[68] It is, as Steffen Dalsgaard points out, a "constant in nature."[69] It is "the element of life," Primo Levi tells us, made available to us mere mammals primarily by the greenery of trees and other plants when they convert energy from the sun.[70] The problem with carbon, instead, comes when its state of being is changed: when it is released into the gaseous atmosphere, primarily when some humans burn very old trees and plants—a.k.a. fossil fuels—and, to a much lesser extent, when they burn living ones. Valorizing carbon also centers on its state of being: it requires not that carbon be extracted or disappear but instead be held in place.

When I began to focus on the ontological issue of carbon's state of being, instead of on carbon as a thing I could follow, I began to approach it relationally. Specifically, I began to focus on the diverse social and environmental relations that determine whether carbon stays in place or is released. Using a translation of the Brazilian term *socioambiental*—with its helpful amalgamation of nature and culture—I explore these as "socioenvironmental relations."[71] If, as Sarah Besky and Alex Blanchette write, drawing from feminist scholarship, "the ability of one person to stand on a factory floor is the product of a vast assemblage of contingent relations,"[72] something similar is true of the ability of one tree to stand, especially in a threatened landscape. After all, there is no standardized forest, even if forests may be represented as such in climate modeling, discourse, and negotiations. There are only living forests. And each living forest lives through particular, if patterned, socioenvironmental relations. Neither is there standardized forest carbon, even if it can be made to seem so.

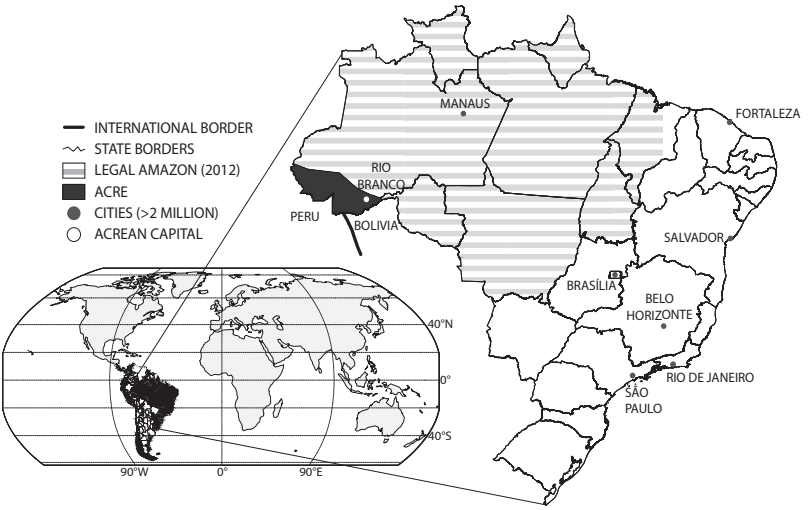
While forest carbon offsets and other carbon credits may be immaterial in that they represent an absence, then, they are also dependent upon the diverse socioenvironmental relations of living forests and their protection. As Tracey Osborne and Elizabeth Shapiro-Garza describe in their analysis of forest carbon projects in Mexico, "Because these [forest carbon] offsets are actively produced when carbon is sequestered in trees, they have an unbreakable and continuous bond to living biomass and can therefore never be fully divorced from the place of production or the people who produce them."[73] That bond means that producing nothing necessitates the ongoing, contingent, and contested work of engendering and shaping socioenvironmental relations in order to protect forests. These relations constitute forest carbon—carbon held in place in forests rather than released—and each forest carbon offset or other monetized unit of emissions reduction represents some assemblage of them.

In Acre, forest carbon valorization entailed forest protection of a particular state-centric sort. There are a number of existing conservation policies that work through restricting and punishing deforestation. Foremost among them is Brazil's federal Forest Code, which requires Amazonian landholders to keep up to a striking 80 percent of their land as forest, with fines for those who violate this requirement. At least on paper, a significant portion of the Brazilian Amazon is also protected through being designated as an Indigenous territory or other kind of protected area.[74] Yet while the effort to produce nothing in Acre was linked to these laws and regulations, it was more directly pursued through a different approach: it entailed a state-driven

effort to make forest carbon and the living forest itself valuable. The aim was, I came to understand, to shift the "diverse, intimate network of human and non-human relations" that Laura Bear, Karen Ho, Anna Lowenhaupt Tsing, and Sylvia Yanagisako argue comprise capitalism—to make those relations protect the living forest by making it into a source of economic value, and, in this sense, to make capitalism green.[75]

Instead of following forest carbon, then, this book traces efforts to valorize Acre's living forest and the carbon sequestered in it as processes of making and modifying socioenvironmental relations.[76] While they were meant to keep Acre's forests standing, these relations tended not to center on the forest itself. Often they were governmental, working through state governance of the forest and those smallholders who lived in and near it. Here the state did not seek to create a neoliberal market, corporate ownership, or private property within its borders, but instead sponsored environmentally focused redistribution that promoted certain socioenvironmental relations. The relations could involve multiple species and enlist different trees, plants, and animals—both within and outside of the forest. They could be infrastructural, bound up in the building of roads and water sources, as well as associated visions of developmental progress.[77] They sought to produce more from rural landscapes, rather than less. They were enabled and constrained by histories and presents characterized by colonizing resource extraction, deforestation, and property relations. They conjured a speculative green capitalist future in which the value of the living forest both kept climate-changing carbon in place and secured the well-being, belonging, and citizenship of poor rural people. Producing nothing, then, entailed efforts to produce many other things—different sorts of socioenvironmental relations as well as myriad types of products from forests and fields. And, unintentionally, these efforts to produce nothing produced other effects as well.

Some of the work to produce nothing takes place at international conferences, like Rio+20 and the 2007 UN conference at which Stoltenberg spoke. Some of it is undertaken by corporations, governments, and intermediaries (like carbon traders, NGOs, and auditors) based in the Global North's centers of GHG emissions. But much of the work occurs in and around tropical forests located in places like Acre, both in the rural areas that are often the focus of critical analysis and imagination of the Global South, and in urban government and NGO offices, museums and public spaces, universities, and businesses working to valorize the forest and its carbon. That work is the focus of this book.[78]



Map I.1 Map of Acre. Created by Justin Mankin.

O Acre Existe!

The question of how to produce nothing held particular resonance in Acre—a state small in terms of both human population (about 830,000 people) and size (about 164 thousand km²).[79] As in many other parts of the Brazilian Amazon, the vast majority of Acreans (about 96 percent) do not identify as Indigenous, though they may have Indigenous heritage.[80] The state is located far from Brazilian centers of cultural, economic, and political power (see map I.1), and it became a part of Brazil only at the beginning of the twentieth century and a state in 1962. To many who lived there, Acre could also feel peripheral to the Brazilian economy. Acrean friends and acquaintances alike frequently griped to me that nothing was produced there—*O Acre não produz nada*, they said. Everything they bought, it seemed, had to be trucked in from Brazilian states to the south or imported during periodic shopping trips to the Bolivian border town of Cobija. For some Acreans, this was a failing that seemed linked to the forest that covered over 85 percent of the state.[81] "There is no economy here," one Acrean taxi driver warned me when I told him I was studying the state's economy. "There is only forest." To study the economy, I should head to São Paulo, he advised.

The state's forest and lack of production could seem like evidence that a common Brazilian joke about Acre was, in fact, true: the state didn't really

Figure I.1 "Acre: do you believe?" T-shirt. According to the Acrean journalist Altino Machado, the shirt was made through a website called Jovem Nerd. Machado writes about it in his discussion of the jokey theory that Acre does not exist. Altino Machado, "Não dá pra levar a sério," November 6, 2008, http://www.altinomachado.com.br/2008/11/no-d-pra-levar-srio.html.

exist; *"O Acre não existe*!"[82] When I mentioned to people elsewhere in Brazil that I was living in Acre, they almost always told me some version of this joke. "Acre?!? Are you sure it even exists?!?" the woman behind an airport check-in counter in Rio de Janeiro teased. "Wasn't it just full of Indians (*índios*) and jaguars," others quipped. Wasn't it where Santa Claus and the tooth fairy lived? Did they even speak Portuguese there? One acquaintance silently crossed himself, pressed his hands together in prayer, and turned his eyes upward to God, as if pleading on my behalf. *O Acre não existe* is a hashtag on Twitter, the "conspiracy of Acre" has its own Wikipedia page, and there is a T-shirt that asks, "Acre: Do you believe?" (figure I.1). A 2014 documentary—*O Acre Existe*—made by São Paulo–based filmmakers is meant as a sort of rebuttal. The film poster advertises that "it's not known whether [Acre] is the beginning or the end of the world."

The joke points to something serious: the Amazon's long-standing position as both a frontier supplying global capitalist supply chains and a place of alterity from which global capitalism has been challenged and reworked.[83]

It is a place that might generate "ideas to postpone the end to the world," as Indigenous Brazilian thinker Ailton Krenak puts it.[84]

In Acre, the forest and peoples' relationships with it have been central to this dual role. Most directly, Acre's forests were a key source of rubber during the nineteenth- and twentieth-century rubber boom (Ciclo da Borracha). In the late nineteenth century, when Acre was predominantly Bolivian territory, the high price of rubber and Acre's high quality rubber trees attracted thousands of Brazilian migrants to the area, eventually leading to its incorporation into Brazil. Most Acreans I knew offered family histories linked to this and subsequent rubber-driven migrations. These included both government and NGO employees and the smallholders they enlisted in valorizing the forest. Acrean rubber enabled accumulation and industrial economies in far-off economic "centers," like so many frontiers.[85] Floated downriver, Acrean rubber formed the tires of the new bicycles and automobiles that multiplied in distant cities, and the United States colluded with Bolivia to secure a piece of the rubber-rich territory for itself.[86] For a time, Acre was "one of the most commercially desirable stretches of territory on earth."[87] So, while green capitalism was new to Acre, Acrean forests have long been enlisted in global capitalism through rubber.

However, after the rubber economy collapsed, starting in the late 1910s and then again after a temporary resurgence during the Second World War, Acre's forests made it a target within a national economy, culture, and governmental system that often valued deforestation as a tool of the entwined processes of colonization and extractive capitalism.[88] Recall the Amazonian land-grabber's assertion: "If we didn't deforest, Brazil wouldn't exist, nothing would exist." Even the country's colonial-given name comes from a tree—*pau-brasil* (brazilwood)—which the Portuguese cut and exported to Europe to make a valued red textile dye. The widespread extraction of the trees spurred further clearing in the Atlantic Rainforest, which was decimated—and violently colonized—to grow coffee, sugar, and other cash crops. More broadly, government officials have often sought to shore up control over the massive territory by encouraging deforestation.[89]

Starting in the 1970s, similar processes were underway across the Amazon. Brazil's dictatorship (1964–1985) sought to consolidate sovereignty there via deforestation-led "development."[90] Most of the deforestation in Acre has been carried out by large-scale cattle ranchers, many of whom immigrated there at the dictatorship's encouragement. That deforestation entailed not only killing trees but also the violent dispossession of rubber tappers and Indigenous peoples. Encouraged by policy and practice around property

rights, infrastructure, taxes, and credit, as well as demand for beef, deforestation accelerated in Acre through the neoliberalization of the 1990s. Monocrop agribusiness loomed to Acre's south as an "arc of deforestation"—fire then soybeans—seeming to move inexorably northward.[91] Acre seemed like it might become just another extractive frontier.

Frontiers are sources of not only material resources, like rubber, beef, and soy, but also imaginative ones. Since its colonization, the Amazon has loomed in European and North American understandings of nature as a biodiverse and resource-rich paradise untrammeled by human hand. It has drawn white macho adventurers from the Global North like Teddy Roosevelt, as well as innumerable profit seekers pursuing visions of El Dorado.[92] At the same time, deforestation and biodiversity loss has meant that the Amazon has also symbolized environmental destruction, as a paradise lost.[93]

Most recently, the Amazon has been understood internationally as the imperiled "lungs of the Earth" and as both the cause of and cure for the climate crisis. When Amazonian deforestation increased dramatically before and during the presidency of Jair Bolsonaro (2019–2022), France's president, Emmanuel Macron, tweeted in August 2019, "Our house is burning. Literally. The Amazon rain forest—the lungs which produces 20% of our planet's oxygen—is on fire." A tweet from the actor and environmentalist Leonardo DiCaprio from the same time concurred: "The lungs of the Earth are in flames." Carbon markets can also position the Amazon and other tropical forests as "climate frontiers," where sequestered carbon keeps the planet habitable even as fossil fuel emissions are allowed to continue elsewhere.[94] In this, carbon markets are aligned with long-standing dynamics of extraction in the Global South that facilitate enrichment in the Global North, as well as related Brazilian nationalist concerns about their control over the Amazon.

Yet frontier spaces can also allow for modes of thinking and being that may differ from the dominant societies they supply, materially and imaginatively. Such is the case in the Amazon, which thinkers like Brazilian writer Eliane Brum have positioned as "the center of the world."[95] Exemplifying this dynamic, Acre has played an important role in environmentalist thought internationally. Acre's rubber tappers famously organized against deforesting ranchers in the 1970s and 80s, garnering significant international attention and support for reframing deforestation as a matter of socioenvironmental injustice. In the ruins of the rubber economy, rubber tappers built on their socioenvironmental forest practices to create new forms of land rights and forest conservation that shaped environmental organizing and governance around the world.

In the decades that followed, Acre also became known as a leader in forest-focused development in certain environmentalist circles. An environmental-technocratic middle class, comprising both Acreans and outsiders drawn to this project, developed in the state. They sought to reinvent Acre as a center of forest governance and culture. Particularly after the 1998 election of the self-proclaimed state "Government of the Forest" led by the left-of-center Workers' Party (PT), government officials and NGOs promoted a forest-linked Acrean identity, developed systems for participatory governance, and adopted state policies meant to simultaneously spur forest protection and economic development.[96] They promoted this as a new approach—my state interlocutors told me—that, in the words of former Acrean governor and senator Jorge Viana (brother of Tião Viana), "demonstrate[d] . . . that development does not depend on the destruction of the forest, but rather on its survival."[97] As Marianne Schmink describes it, "The goal was no less than to create—for the first time—an articulated, statewide model of sustainable development with interlinked ecological, economic, political, and cultural goals."[98] The forest was meant to be Acre's "passport to the future," as Carlos Antônio da Rocha, the Secretary of Forests and Extractivism under the Government of the Forest, put it.[99] In this, he invoked what Kregg Hetherington calls the "promissory nature" of infrastructural and development projects in frontier settings.[100] Hard work in the present would pay off in future prosperity. But, while usually in frontier settings that hard work entails deforestation, in Acre, it required refraining from it. We might understand this forest-centered development strategy as an assertion: *O Acre existe*!—not through the forest's destruction but rather through its valorization.

The last legislative act of the Government of the Forest was the 2010 passage of the law creating SISA.[101] SISA included a forest carbon program that was the lodestar of this new state policy. NGOs and government officials had initially considered creating a delineated REDD+ project in a few priority areas within the state but then decided to expand it to include the state's entire territory. "We started with a project and ended with a system," two of its developers marveled to me separately at the Rio+20 International Forest Day event. It was as if they had surprised themselves. In this system, the Acrean government measured deforestation across the state's entire territory—rather than focusing on a specific region within it—and compared it with the projected BAU rate. The government could then sell the difference as carbon offsets or otherwise receive monetary compensation for it, as it did, for example, through the €25 million in payments from KfW via the REM

program. In a second phase of the program (2017–2022), agreements offered €30 million from Germany and a new contributor (the United Kingdom), among other funding sources.[102] Overall, a 2022 state government estimate stated that REM had raised more than R$175 million, with a former SISA official estimating that the program brought in closer to R$200 million.[103]

The idea of making Acrean forest carbon monetarily valuable was not simply an external imposition from the Global North, then—one that imagined the Amazon as a carbon reserve.[104] Rather, forest carbon's valorization was also entangled in Acrean environmental politics and the state's effort to enact a form of forest-dependent—rather than deforestation-dependent—development.[105] In this effort to valorize the living forest and its carbon, Acre's existence comes into view not just in the injustices of extractive capitalism and resistance to it—dynamics for which the Amazon is so often known—but also through efforts to create a different sort of development and, with it, greener capitalist practices. These efforts worked through a logic of inclusion and were funded in part by forest carbon's new monetary value.

Inclusion

Instead of pushing rural people or different species off land to maximize carbon sequestration, the Acrean state sought to include many of them in its efforts to make the forest and its carbon valuable. These efforts often involved the distribution of benefits to rural people and aimed to include them in the creation of a productive, low-carbon rural economy envisioned to benefit both them and the forest. These benefits were partially funded by forest carbon's new international value, through payments like KfW's for Acrean emissions reductions. Many of them aimed to get rural people to produce more in ways deemed to not require more deforestation, in contrast to the dominant form of deforestation-reliant cattle ranching (participating Indigenous communities tended to receive different kinds of benefits).[106] The benefits included a subsidy for collecting native rubber, a monetary "bonus" paid to those who committed to "sustainable" agricultural practices, fishponds constructed on "degraded" pastureland, açaí palm seedlings meant to be planted in deforested land, and mucuna seeds—a legume that fixes nitrogen, thereby negating the need to burn the forest to fertilize the soil.[107]

In other words, the effort to valorize the living forest and its carbon did not focus on getting rural people to produce nothing. Instead, it tried to entice them to produce more. This strategy was clear when I visited or stayed with smallholders in rural Acre. Sometimes I visited them with state agri-

Figure I.2 Mucuna drying in the sun. Photo by Maron E. Greenleaf. Feijó, Acre.

cultural extension technicians. One took me to see mucuna at work on the land of a smallholder family he was visiting. While the government usually distributed mucuna seeds, a few smallholders grew them themselves. Removing the seeds from their pods was labor intense work, I saw. A boy, perhaps eleven or twelve years old, wielded a heavy stick, repeatedly hitting the ground. His body moved rhythmically up and down with each swing. But his eyes did not leave his target: a layer of dark podded beans spread out to dry in the blazing sun (figure I.2). The pods cracked open under his effort. Under the shade of a thatched, wall-less structure nearby, the boy's mother separated out the cracked pods from their insides: small black mucuna seeds.

Mucuna was also the focus of the ongoing conversation between the woman's husband and the technician who had brought me. Mucuna, while toxic to eat, could be useful for growing other crops because of how it fertilized the soil. As the boy's father walked us around, he told me that this family had been growing and using mucuna in their small, rainforest-backed fields for six years. With pride, he gestured to pineapples growing fat in "dead mucuna." He held up a sprawling, multipronged manioc root—a staple food (figure I.3). The technician explained to me that because of mucuna, the

Figure I.3 Manioc grown in "dead mucuna." Photo by Maron E. Greenleaf. Feijó, Acre.

man no longer had to cut and burn the forest to create fertile soil. Instead, the family could simply keep growing crops on the land they had already cleared. He compared the mucuna-fertilized fields around us to a well-kept house, contrasting them with what he described as the mess (*bagunça*) of the neighbors' land.

I later learned that, around this part of the settlement, the family was known for their mucuna. Others sometimes called them "mucuna" as a nickname. I picked up the habit too, coming to think of them as the mucuna family. Months after my visit, I recognized the patriarch of the mucuna family showcased in a photo on the website of a state-linked environmental NGO. He was the picture of success.

I came to think of such state programs as inclusive, and particularly as promoting a kind of inclusive productivism. Rather than simply pushing poor rural people out in favor of large landholders or corporate interests, these programs enlisted them in green capitalism. The state programs provided benefits (in the form of inputs like mucuna seeds, for example), training about how to use the benefits, or simply monetary rewards. Mucuna and other forest benefits funded by forest carbon's new value were meant to bring smallholders, like the mucuna family, into a forest-protective version of the Brazilian productivism that had long linked rural belonging to land use and yield. By producing more through mucuna and less through de-

forestation, the mucuna family would help to create, and be part of, green capitalism. In so doing, this approach sought to inclusively combat the nagging anxiety that Acre—where nothing was produced—might also not actually exist. Forest carbon was the latest resource, the latest crop, whose production was meant to secure poor rural people's welfare and citizenship and the state's sovereignty.[108] As Carlos Edegard de Deus, the Acrean state environment secretary at the time, said at a SISA-focused event in 2017, the state government's goal was the "inclusion of the neglected: Indians [*índios*], rubber tappers, riverside peoples [*riberinhos*], and land reform settlers. We have always fought for the inclusion of everyone, provided they adhere to the principles of sustainability."[109]

There were several reasons that the Acrean state took an overtly inclusive approach to making the forest and its carbon valuable, I came to understand. For one, forest protection can be difficult without local support. Some resources depend on minimal local labor or can be produced or extracted under compulsion, generating significant wealth that states can capture as rent.[110] Keeping carbon sequestered in tropical forests is quite different. Forests can be difficult for often distant city-based bureaucrats to effectively govern; there is often much they do not know.[111] As Tania Li writes, "The forest edge is a site of struggle, but it is difficult to control by coercive means."[112]

In Acre, while past deforestation had been predominantly executed by large-scale ranchers, an increasing portion of it was being undertaken by smallholders, sometimes at the directive of larger ranchers or because of smallholders' increasing imbrication in the ranching economy. Large-scale deforestation was, in some ways, easier to police. It was easier to detect via state-run remote sensing monitoring, and it was easier to villainize and fine large landholders. Poor smallholders were a more sympathetic group, one which the PT saw themselves as helping. Moreover, their smaller-scale deforestation was harder to detect via remote sensing, and they were harder to punish, both politically and administratively. And small-scale deforestation could be part of legally permissible traditional forms of swidden agriculture, in which clearing a hectare or two to grow crops is followed by decades of encouraged or permitted forest regrowth. The need to address smallholder deforestation therefore militated for a more inclusive approach to forest protection—a form of "environmentality" in which rural people were enlisted in making the living forest valuable.[113] Inclusion was, in this sense, a governance strategy for an under-resourced and city-based government in the context of smallholder deforestation.

"Social inclusion" (*inclusão social*) was also an explicit priority and strategy of the PT, which governed at the federal level from 2002 to 2016 and in Acre from 1999 to 2018.[114] Through social inclusion, the PT aimed to, in party discourse, "give to the poorest people in Brazil the right to fully realize their citizenship and be respected as people."[115] The PT's conception and practice of social inclusion relied in part on distributing material benefits. In Acre, I will explore, those included benefits linked to forest protection. Funded by forest carbon's new international monetary value, forest benefits can be considered part of the natural resource–funded redistribution typical not only of Brazil's PT governments but also of many so-called Pink Tide leftist and left-of-center governments elected in the region in the early twenty-first century.

In Acre, the living forest seemed to bolster the PT's hold on state power and its approach to social inclusion, like "petro-states" whose legitimacy and authority is bound up with their access to oil.[116] The PT administrations promised they would be able to access the forest's new international value. At the same time, keeping forest carbon sequestered also became a way for the state to pursue smallholder inclusion. In this, forest carbon's new monetary value funded, justified, and shaped forest-focused redistribution. In other words, that value enabled an environmental version of the distribution-centered inclusion that has developed in articulation with neoliberalism in parts of the Global South. As James Ferguson writes, "While many influential accounts of neoliberalism have seen only ever-growing social exclusion, we here must also take stock of a new kind of *in*clusion as millions of poorer citizens previously ignored or worse by the state have been direct beneficiaries of cash payments."[117]

As part of market-based efforts to combat the climate crisis, the Acrean forest's new value facilitated and was facilitated by state redistribution and the attendant development of a type of welfare state that governed and sought to benefit—to "make live," to use Foucauldian terms—certain types of subjects, multispecies relations, and landscapes.[118] In distributing forest carbon's new value as state benefits, this environmentally premised redistribution shaped the state and its relations with those it sought to govern. It engendered a kind of nascent "carbon democracy," to use Timothy Mitchell's term, that impacted political practice, governance, and citizenship.[119] It was a carbon democracy, though, centered not on carbon's extraction for fossil fuel–based energy production—as in the carbon democracies that Mitchell analyzes—but rather on the effort to keep carbon sequestered in the earth and the trees that grow from it.[120] Green capitalism, in other words, developed in Acre not through private property, markets, or other

hallmarks of neoliberal capitalism, but rather through the elaboration of a state that sought to include and benefit some marginalized people and landscapes on environmental terms.

The reasons for the prominence of social inclusion in Acrean forest valorization are in some ways particular to Acre, and yet also speak to a common dynamic in green capitalism. Inclusivity does not deterministically inhere in forest carbon itself and yet it is widespread.[121] While there are many of examples of forest carbon programs that have excluded and otherwise dispossessed rural people, inclusive approaches have been common to forest carbon programs beyond Acre, in part because of Indigenous and forest community organizing.[122] Inclusion can also be seen in some other green capitalist initiatives, such as Green New Deal proposals and aspects of the United States' 2022 Inflation Reduction Act. Such programs seek to include those seen as excluded from traditional forms of capitalism, through state-sponsored integration into reformed but recognizable systems of work, politics, and culture. This inclusion is part of the purported win-win-win of green capitalism—profit, environmental protection, and improved human well-being. In this, inclusion is one of green capitalism's constitutive logics.[123]

Yet, as I explore, this kind of inclusion can also reinforce existing or engender new forms of marginalization. Take the conditionality of the second part of the statement by Carlos Edegard de Deus, the Acrean environment secretary I quoted earlier: "We have always fought for the inclusion of everyone, *provided they adhere to the principles of sustainability*." Those who do not adhere to these principles remain excluded. This implicit threat is the underbelly of Acre's forest valorization strategy, which relies on incentivizing forest protection. Inclusion, then, does not necessarily replace exclusion so much as rework it. Intentionally or not, inclusion can engender, enable, or fail to effectively constrain processes of dispossession. In particular, those who are neglected, as de Deus put it, can be included in ways that are materially and culturally meaningful, but that still maintain their marginality. Take the mucuna family. Using mucuna enabled them to produce and earn more, deforest less, and be part of culturally valued productivism. Through their efforts, Acrean rural production increased, if only slightly. Yet in other ways, they remained on the margins: poor; without ready access to running water, health care, or education; and looked down on by cattle ranchers and urban residents. Inclusion can thereby perpetuate aspects of the status quo, even through efforts to transform it. This contradiction may be less an indication of green capitalism's failure than of its efficacy in engendering capitalist

practices for the Anthropocene that redraw lines of inclusion and exclusion, but maintain much of the economic, political, and cultural status quo.

The Amazon at Eye Level

Outsider ideas about the Amazon (my own included) and Amazonian ideas about outsiders (myself included) shaped my research, analysis, and writing—what I noticed, who spoke with me or invited me into their homes, and what we said to each other there. I was part of a long history of outsiders from the Global North coming to Amazonia for adventure, for profit, to "save the rainforest," or to work with the rubber tapper movement and Government of the Forest.[124] Many of those most critical of REDD+ and green capitalism suspected that I was in Acre to further them. Others who favored more deforestation thought I was another foreigner there to tell them to stop, even as my own country's wealth was predicated on it. "You've already cut down all your trees," one acquaintance teased me in what became a familiar refrain over lunch at his house on my second day in Acre. Now I had come to tell Acreans not to cut down theirs.

I worked to see and think beyond these established narratives, starting with how I studied the deforestation that has made the region of international environmental concern. Like many outsiders, before my research, I primarily knew the Amazon from above, through shocking images in popular media and land-use change science of apparently untouched rainforest turned to monocropped soy or cattle pasture. These images are important: remote sensing and other analysis reveal socially and ecologically consequential deforestation and forest degradation, which can direct resources, shape policy, and illuminate essential socioenvironmental dynamics. Yet aerial imagery and analysis can also be used to perform a kind of "god trick" that can conjure a clear distinction between "natural" forests untouched by human hands and fields fully converted to human use.[125] The reality is more complex. Ancient geoglyphs unearthed by recent deforestation in Acre and research on continued Indigenous and other traditional forest cultivation practices, for example, challenge the firm distinction between forest and field, and through them, nature and culture.[126] Moreover, the label *deforestation* can homogenize smallholder forest clearing—which is important to their precarious livelihoods and traditional swidden practices—and the violence of large-scale forest clearing.

Approaching deforestation at eye level, as I did in this project, can reveal its heterogeneity and, with it, the socioenvironmental relations that shape

Amazonian landscapes and either hold carbon in them or release carbon from them. The forest often appeared to me as neither unbroken nor fully destroyed. Rather, the rural landscapes I encountered were inhabited and reworked. There were, of course, the large cattle ranchers' fields—mostly empty, a monochrome and blanched green-brown color, and lined by distant forests. Yet next to them were patchy landscapes that smallholders narrated to me in ways that blurred firm divisions between natural forest and decimated human landscapes. They were what Hugh Raffles calls "aspirational landscape[s]"—the outcome of hard and uncertain work, enmeshed in global capitalist processes, and tended with an eye toward making a better future.[127] The mucuna family had, for example, just burned a small patch of forest to grow more of the bean, the man explained to me proudly as we walked around his land. It was a testament to the entanglement of forest and field within the state effort to make the living forest valuable. My account of this effort reveals some of this complexity, which can be obscured in aerial analysis.

This book, though, is not primarily an ethnography of rural Amazonian life. For one, the forest I studied was not just the rural arboreal one. With more than 70 percent of the population living in cities and over 85 percent of the state considered forested, Acrean relationships with the forest were also urban.[128] And the Amazon is also more than its forest. It is also composed of roads, factories, fields, and the people who build them, work in them, and dream of them. All of them were also entangled in the effort to make the forest and its carbon valuable. This book is about them too.

Most of the time, I lived in Acre's capital city Rio Branco, where I conducted about eighty in-depth interviews with government officials, NGO workers, academics, and businesspeople about the forest, its destruction, and its protection. Most seemed happy to talk, or at least were willing to do so. Many had worked with foreign environmentalists or researchers, some of whom were from elsewhere in Brazil. I also attended workshops, community meetings, and forest-related events and visited government institutions involved in valorizing the forest and forest carbon. In particular, I spent a lot of time at the Institute for Climate Change and Environmental Services (o Instituto de Mudanças Climáticas e Serviços Ambientais—called the IMC), the new state institution created to administer SISA. At the IMC, I interviewed staff, attended meetings and workshops, provided comments on draft documents, once filled in as a last-minute translator, and often sat at a desk I was generously provided. I also spent a significant amount of time at the Secretariat for Agroforestry Extension and Family Production

(a Secretaria de Extensão Agroflorestal e Produção Familiar—SEAPROF), which administered some of the SISA-funded forest benefit programs. There, I attended meetings, interviewed staff, and accompanied some of them on visits to the field (*o campo*).

The rural area in which I spent the most time was a municipality called Feijó, which also has a small city by the same name. That was where I first worked as the coleader of a twelve-person research team. Comprised primarily of Acrean university students and recent graduates, the team conducted a survey for the Center for International Forestry Research (CIFOR) study. This prominent forest-focused research organization, based in Bogor, Indonesia, was studying REDD+ efforts at twenty-six sites in seven countries around the world.[129] Our team administered the survey, asking over two hundred smallholders about their land uses, possessions, agricultural production, and the impact of SISA-linked interventions, among other questions. The following year, I hired one of the CIFOR team members, whom I call Fernanda, as a research assistant to return to Feijó with me.[130] We stayed and talked with some of the smallholders whom CIFOR had surveyed, interviewing about thirty of them and spending time with a smaller subset.

The mixed-heritage rural smallholders with whom I spoke and spent time often referred to themselves, and were often referred to by government officials, as rural producers (*produtores rurais*)—a term I also sometimes use in this book. This term differs from many others used to describe rural people in the Brazilian Amazon. Accounts of themselves as former rubber tappers or descendants of them emphasized stories of their forebears' migration to Acre from the parched Brazilian northeast to tap rubber in Acre's forest, eliding Indigenous ancestry.[131] Yet this rubber tapper heritage did not mean that they described themselves to me as extractivists (*extractivistas*)—the local term used to describe those who collect forest products like rubber. Neither did I hear peasant (*camponês*) or the derogatory term *caboclo*. I heard the term *rural worker* (*trabalhador rural*) only occasionally; it had been important to the rubber tapper movement and helped to position rubber tappers as workers in a society in which that category carries legal rights and sociocultural status.[132] Yet I heard it infrequently and mostly in relationship to rural workers' unions, which smallholders in Feijó described to me either as now being corrupt or irrelevant, except to access certain government benefits.[133] Another term—*fazendeiro* (literally *farmer*)—implied high social and often outsider status.[134] It was usually reserved for cattle ranchers who lived in the city or another state. *Rural producer*, in contrast, was a term associated with many rural people's diverse livelihood strategies,

including small-scale agriculture (primarily manioc), paid daily labor (for *fazendeiros* or for other rural producers for short-term work, such as forest clearing), cattle ranching, hunting, and the collection of forest products (e.g., Brazil nuts and açaí).[135]

The prominence and acceptance of the term *rural producer* points to the dominant cultural valorization of certain forms of productivism.[136] That it was used by smallholders themselves in many communications (that I witnessed) with state representatives and separately with me indicates that inclusion in that productivism was something which some of them aspired to or used to access resources and cultivate relationships with the state. In other words, calling oneself or someone else a rural producer could itself be a claim to inclusion and belonging in a society that valued production.

The Road Ahead

The rest of this book consists of five chapters interspersed with interludes and an afterword. A road called the BR-364 meandered through my research, and it meanders through this book as well.[137] In the Amazon, roads are the classic harbingers of deforestation.[138] Before coming to Acre, I had read about them in articles on deforestation and watched Google Earth and NASA time-lapse videos of aerial imagery that showed deforestation seeming to inexorably seep from roads in a fishbone pattern. I had also learned about what was implied but could not be seen in these images: the movement of people—like colonists (*colonos*), miners, and loggers—and attendant violence against Indigenous and other forest communities that is so often part of deforestation.

In particular, I had heard about a road called the BR-364, which stretches from Limeira in the state of São Paulo to Mâncio Lima, close to the Peruvian border in Acre, where it essentially dead-ends (see map I.2).[139] In Acre, much of it was a two-lane highway that, in places, was still in the process of being paved. And it was the only paved road linking the state to the rest of Brazil. I had first heard about the road because of how its paving had facilitated massive, rapid, and violent deforestation in the neighboring state of Rondônia in the 1980s.[140] Seeking to avoid a similar outcome in Acre, the famed Acrean rubber tapper and community organizer Chico Mendes had, along with many others, worked against the BR-364's paving into the state. This activism, along with transnational environmental organizing, led the World Bank to temporarily suspend funding for the project and to the recognition of some Acrean rubber tappers' land rights.[141] Decades later,

Map I.2 Map of the BR-364. Created by Justin Mankin.

when the last stretch of the BR-364 was being paved in Acre in the early 2010s, the Acrean government sought to avoid the extensive road-linked deforestation that 1980s Rondônia had exemplified. Making the forest and its carbon valuable was central to this effort.[142]

I use the BR-364 to connect and elucidate some of the socioenvironmental relations enlisted in the effort to make the living forest and its carbon valuable, as well as to reveal the tensions within this effort. This approach builds on my experience of the road. I rode certain stretches of it a lot since it connected Rio Branco, where I lived most of the time, and the municipality of Feijó, located about five to six hours northwest, where I conducted most of my rural research. I always traveled the road in other people's vehicles. I rode on it with the CIFOR research team. Sometimes I squeezed into crowded trucks next to agricultural extension technicians who were trying to get smallholders on the BR-364 to stop deforesting. Once, I traveled it in a spacious luxury van with two forest carbon project developers and the two

American auditors whom the developers had hired to visit one of their forest carbon projects. And I rode in the truck of a traveling salesman named Carlos, whom I hired to drive a research assistant and me on the BR-364 and its dirt side roads (*ramais*) in Feijó. Most of the smallholders I write about lived directly on the road or on a side road or trail off it. We sometimes drove on the road together. And the road also moved through many of our conversations. The smallholders talked about how much it had improved their lives and how it was already falling apart, just after being paved.

In Acre, in other words, the BR-364 was more than a harbinger of deforestation. It was also integral to both daily life and its governance. Smallholders in Feijó told me that the BR-364 facilitated a form of inclusion via improved access to education, health care, and the stuff of consumer life. And some urban residents traveled it frequently for work and pleasure. In its integration in everyday life, the road aggravated inequality, emphasized rural peoples' continued marginality, and indexed governmental ineptitude and corruption, even as most residents also valued it.

The BR-364 was also important to green capitalism. It connected state officials with those they sought to govern, enabling the distribution of forest benefits to smallholders. It was how agricultural extension technicians originally brought mucuna to the mucuna family and then subsequently visited them to promote its use. And it connected smallholders with buyers for the products that the state wanted them to produce. In other words, the BR-364 was simultaneously the thing from which forest carbon needed to be protected and a means of protecting it. In this, it elucidates both the effort to value the living forest and the tensions within this iteration of green capitalism.

In the book's first chapter, the BR-364 appears only briefly, to note the deforestation its paving precipitated in Rondônia. Chapter 1 centers on a key component of the effort to make Acrean forest carbon valuable to potential carbon offset buyers in places like California: Acrean rubber history and its retelling. I call this retelling the *rubber narrative* and explore how it both differentiated and standardized Acrean forest carbon in ways that elucidate green capitalism. The chapter also examines forest carbon's materiality and temporality. Chapter 2 explores how Acrean forest protection centered on increasing, rather than decreasing, production—of many things other than carbon. Specifically, the chapter focuses on efforts to increase açaí berry production in forests and fields as part of the effort to make the forest valuable. It explicates what I call *inclusive productivism* to show how green capitalist inclusion can reinforce the marginalization

it purportedly seeks to combat, in ways that can both modify and reinforce the status quo.

Chapters 3 and 4 examine forest benefits distributed by the state and NGOs along the BR-364, centering on the socioenvironmental relations and politics this distribution entailed. Chapter 3 traces how the Acrean state made forest carbon's new international value into a kind of public wealth it then redistributed to some rural people. Examining this as a form of statecraft, it also argues that this approach engendered an environmentally premised welfare state that, while inchoate and not always effective, differed substantively from the private property–making and –enforcing state envisioned in both supportive and critical discussions of forest carbon and neoliberal capitalism. Yet, in avoiding property, this approach also skirted the powerful forms of belonging that rights to land can engender. Chapter 4 examines the forest beneficiary as a figure of environmentally mediated and negotiated citizenship, in conversation with the Acrean state's understanding of the concept of *florestania*—a term often translated as forest citizenship. It traces negotiations between agricultural technicians and smallholders over what it should mean to be a beneficiary, pointing to the mutual dependence in the Anthropocene that the term ultimately reveals.

Chapter 5 explores forest valorization, and green capitalism more widely, as a cultural project. Efforts to make the forest culturally valuable were deeply linked to efforts to make it monetarily valuable in ways that reshaped the Acrean capital Rio Branco and the lives of some of its residents. This urban forest, as I explore it, sought to include the forest and forest people in dominant culture, transforming it in the process. Many urban residents benefited from this cultural valorization through its forest-themed public space and culture, as well as secure middle-class employment governing the forest from the city. Rural poverty and marginalization, though, continued in ways that the crumbling BR-364 could seem to embody. The chapter elucidates how the limits and contradictions of the forest's cultural valorization undermined green capitalism in Acre.

In between these chapters are four interludes centered on the BR-364. They ethnographically elucidate deforestation, production, inequality, and aspiration in daily Acrean life along the BR-364 in Feijó and beyond. Finally, in the afterword, I look at how Acrean forest carbon valorization helps us to understand both the changes that were to come—namely, the rise of Jair Bolsonaro, allied politicians in Acre, and deforestation there—as well as the continued expansion of green capitalism around the world.

NOTES

Preface

1 I use both *climate change* and *climate crisis* in this book to denote geophysical changes associated with the atmospheric buildup of greenhouse gases on the one hand and their broader effects on the other. Neither term, though, feels adequate. The climate is changing, but *climate change* fails to communicate its extent and urgency. *Climate crisis* seeks to convey that urgency and motivate action, yet it can also cultivate despair. As Joseph Masco writes, "crisis talk" can generate a paralyzing "radical presentism" that "can work to maintain a status quo" by undermining the imagination and enactment of "alternative futures." Masco, "Crisis in Crisis," S73, S75. Something similar could be said about the term *climate emergency*, which I do not use in this book to avoid a confusing proliferation of terms.

2 See Jasanoff, "New Climate for Society," for an analysis of climate change's epistemic challenges and opportunities; Chakrabarty, *Climate of History*, and Pandian, *Possible Anthropology*, for examinations of how it reworks fundamental conceptions about humanity that underwrite disciplines like history and anthropology; Ghosh, *Great Derangement*, for an account of the difficulties of writing about it within established literary forms; and Knox, *Thinking like a Climate*, 6, for an exploration of the difficulties posed by climate as a "form of thought."

3 Attention tends to coalesce around occurrences that are read as events in ways that it does not around more everyday and slower forms of violence. This makes the latter harder to perceive. See Ahmann, "'It's Exhausting to Create an Event out of Nothing'"; Nixon, *Slow Violence and the Environmentalism of the Poor*; and Sahlins, "Return of the Event, Again."

4 Frontline communities tend to face the worst impacts of climate change due to historical and ongoing forms of injustice that can also undermine their ability to recover from or adapt to climate impacts.

5 Lovejoy and Nobre, "Amazon Tipping Point"; Walker, "Collision Course." See also Science Panel for the Amazon, *Amazon Assessment Report 2021* (UN Sustainable Development Solutions Network), edited by Carlos Nobre et al., https://doi.org/10.55161/RWSX6527.

6 There are, of course, other definitions of green capitalism. For example, Scott Prudham defines it as "a set of responses to environmental change and environmentalism that relies on harnessing capital investment, individual choice, and entrepreneurial innovation to the green cause." Prudham, "Pimping Climate Change," 1595.

7 David McDermott Hughes, "Ayn Rand's Climate Movement: Libertarians, Juries, and the End of Fossil Fuels" (lecture, Dartmouth College, Hanover, NH, April 27, 2023).

8 See Tsing, Mathews, and Bubandt, "Patchy Anthropocene."

Introduction

1 The conference was the Thirteenth Session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), also known as COP 13. It took place in Bali, Indonesia.

2 Jens Stoltenberg, "Speech at UN Climate Change Conference in Bali," UNFCCC COP, December 12, 2007, https://www.regjeringen.no/en/historical-archive/Stoltenbergs-2nd-Government/Office-of-the-Prime-Minister/taler-og-artikler/2007/speech-at-un-climate-conference-in-bali/id493899/. Stoltenberg was not the first to propose this logic. While "avoided deforestation" was initially excluded from UNFCCC agreements, such as the 1997 Kyoto Protocol, the idea of integrating reductions from deforestation into UN climate mitigation had been under discussion in the UN negotiations and related policy spaces for several years—at least since COP 9 in 2003, at which Brazilian scientists presented the idea of "compensated reductions." Santilli et al., "Tropical Deforestation and the Kyoto Protocol." A new Coalition of Rainforest Nations led by Papua New Guinea and Costa Rica then formally presented the idea of an

international market-based mechanism for compensating for reductions in emissions from deforestation—then called RED—at COP 11 in 2005. Pistorius, "From RED to REDD+."

3 In the years after the 2007 conference, REDD+ was adopted into UN climate policy through the 2013 Warsaw Framework for REDD+ and Article 5 of the 2015 Paris Climate Accords.

4 In his 2007 speech, Stoltenberg himself went on to commit Norway to supplying over US$500 million per year to reducing carbon emissions from tropical forests. Stoltenberg, "Speech at UN Climate Change Conference." Norway has been a major financial contributor to REDD+ in the years since.

5 Concern about environmental destruction and efforts to address it have a long history in Brazil, as José Augusto Pádua shows in *Sopro de destuição*.

6 See Macedo et al., "Decoupling of Deforestation and Soy Production." Rapid deforestation continued in other Brazilian ecosystems, though, including the Cerrado savannah. Strassburg et al., "Moment of Truth for the Cerrado Hotspot." In this, the Cerrado could seem like a "sacrifice zone" enabling Amazonian conservation. Oliveira and Hecht, "Sacred Groves, Sacrifice Zones and Soy Production."

7 Nepstad et al., "End of Deforestation in the Brazilian Amazon"; Justin Gillis, "Restored Forests Breathe Life into Efforts against Climate Change," *New York Times*, December 24, 2014.

8 Malhi et al., "Regional Variation of Aboveground Live Biomass," 1120.

9 See, for example, Climate Focus, "Acre, Brazil: Subnational Leader in REDD+," May 2013, https://gcftf.org/wp-content/uploads/2020/12/Acre_Brazil_Subnational_Leader_in_REDD.pdf; Kelley Hamrick, "Acre and Goliath: One Brazilian State Struggles to End Deforestation," Ecosystem Marketplace, May 5, 2014, https://www.ecosystemmarketplace.com/articles/acre-and-goliath-one-brazilian-state-struggles-to-end-deforestation/; Slayde Hawkins, "Brazilian State Lays Foundation for Nature-Based Economy," Ecosystem Marketplace, December 7, 2010, https://www.ecosystemmarketplace.com/articles/brazilian-state-lays-foundation-for-nature-based-economy/.

10 KfW, "REDD Early-Movers Acre Fact Sheet," 2017, 10, accessed July 1, 2021, https://www.kfw-entwicklungsbank.de/PDF/Entwicklungsfinanzierung/Themen-NEU/REDD-Early-Movers-Acre-Fact-Sheet.pdf.

11 The 2010 SISA law lays out several ecosystem services other than carbon sequestration: natural beauty, socio-biodiversity, hydrological services, climate regulation, soil conservation and improvement, and traditional ecological knowledge. Government of Acre, "Lei N. 2.308," capítulo I.

12 For another anthropological analysis of REDD+ in Acre and elsewhere, see Rodrigues Machaqueiro, *Carbon Calculation*, which deftly analyzes REDD+ as advancing neoliberal transnational governance.

13 Graeber, *Toward an Anthropological Theory of Value*, 2.

14 In this, the Acrean effort to value forest carbon can be understood as part of long-standing rural development efforts critiqued by anthropologists and others. See, for example, Escobar, *Encountering Development*; Ferguson, *Anti-Politics Machine*; and Li, *Will to Improve*.

15 While not yet officially adopted as the geological name of this epoch, in the environmental humanities and humanistic social sciences, the term *Anthropocene* has been both generative and controversial, especially for implying species-wide culpability for environmental harm primarily wrought by the actions of a relatively small number of people, often as part of long-standing forms of colonization. See, for example, Danowski and Viveiros de Castro, *Ends of the World*; Davis and Todd, "On the Importance of a Date"; Haraway et al., "Anthropologists Are Talking"; Kawa, *Amazonia in the Anthropocene*; Marras and Taddei, *O Antropoceno*; Tsing, Mathews, and Bubandt, "Patchy Anthropocene"; Mathews, "Anthropology and the Anthropocene"; and Whyte, "Settler Colonialism, Ecology, and Environmental Injustice."

16 Appel, *Licit Life of Capitalism*, 2. See also, for example, Ekers and Prudham, "Socioecological Fix"; and McCarthy, "Socioecological Fix to Capitalist Crisis and Climate Change?"

17 Moore, "Rise of Cheap Nature." See also McCarthy and Prudham, "Neoliberal Nature."

18 On the role of states in carbon markets see, for example, Bryant, "Politics of Carbon Market Design"; and McElwee et al., "Payments for Environmental Services." Moreover, the categories of public and private and the distinction between them are themselves constructed. They are, Lisa Rofel and Sylvia Yanagisako show, "forged by historically specific processes, including the formation of differentiated transnational capitalist projects" in ways that position states as central to capitalism's varied development. Rofel and Yanagisako, *Fabricating Transnational Capitalism*, 10.

19 The influential economic theory here included the Coase theorem. Named for American economist Ronald Coase, the Coase theorem asserts that, in the presence of clearly defined property rights and the absence of transaction costs, parties can negotiate to reach an optimal outcome that will minimize the effects of negative externalities, like pollution. I read part of Coase's argument in an environment law course but had already heard his name: the law student listserv for buying and selling things was called Coase's List. Such was the broad cultural influence of law and economics

theory at NYU Law. Coase, "Problem of Social Cost." See also Dales, *Pollution, Property and Prices*; Demsetz, "Toward a Theory of Property Rights."

20 On the ways that economic theory can shape the world, see Appel, "Offshore Work"; Çalışkan and Callon, "Economization, Part 1," and "Economization, Part 2"; Callon, *Laws of the Markets*; MacKenzie, *An Engine, Not a Camera*; and Miyazaki, *Arbitraging Japan*.

21 The terms *carbon offset* and *carbon credit* are often used interchangeably, but they may also mean different things. Here is one commonly made distinction between them: offsets represent GHG reductions or removals bought to compensate for a polluter's GHG emissions whereas credits are quantifications of GHG reductions or removals. Credits may be traded within carbon markets, sold as offsets, or purchased to retire without being meant to compensate for pollution through payments for emissions reductions. I generally focus on offsets in this book, as well as payments for emissions reductions.

22 The percentage of their GHG emissions a polluter may cover with offset purchases in carbon markets varies significantly. In Aotearoa New Zealand, for example, regulated entities can cover 100 percent of their emissions with offset purchases. Ministry for the Environment, "New Zealand Emissions Trading Scheme," accessed July 22, 2022, https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/ets/. In California, entities can only cover a much smaller percentage of their emissions (between 5 and 8 percent) with offsets, depending on the year. California Air Resources Board, "Compliance Offset Program," accessed July 22, 2022, https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program/about. Yet, a CARB official told me that even this relatively small percentage is important to cost containment: it keeps the price of pollution allowances down for regulated emitters since offset carbon reductions and removals are often cheaper than reductions made by emitters themselves. This is one major reason that industry groups advocate for offsets within cap-and-trade systems.

23 BAU reference levels and baselines are among the many seemingly technical aspects of carbon markets that, in fact, contain many political choices. As Larry Lohmann, "Uncertainty Markets and Carbon Markets," 244, points out, they make something inherently uncertain and unknowable (what would have happened) seem technical and apolitical. Moreover, it creates an incentive to exaggerate how much you would have polluted without carbon financing. See Bumpus, "Matter of Carbon." I discuss these issues more in chapter 1.

24 United Nations Framework Convention on Climate Change, "Emissions Trading," accessed August 14, 2022, https://unfccc.int/process/the-kyoto-protocol/mechanisms/emissions-trading.

25 Fletcher et al., "Questioning REDD+ and the Future of Market-Based Conservation," 674.

26 Aguilar-Støen, "Better Safe than Sorry?"

27 As quoted in Svampa, "Resource Extractivism and Alternatives," 52, and Coronil, *Magical State*, 1, respectively. Fernando Coronil quotes Cabrujas in his explication of the Venezuelan state's use of and entanglement with oil.

28 See Forest Carbon Partnership Facility, "The Readiness Fund," accessed August 14, 2022, https://www.forestcarbonpartnership.org/readiness-fund.

29 The biggest contribution to the Amazon Fund as of this writing came from the Norwegian government, which paid US$1.2 billion into it between 2008 and 2018. After deforestation increased in the Amazon with Jair Bolsonaro's election as president, Norway and others suspended payments. Daniel Boffey, "Norway Halts Amazon Fund Donation in Dispute with Brazil," *The Guardian*, August 16, 2019.

30 This carbon was then retired within the Markit Global Carbon Index, so that it could not be credited again. As part of the deal, the Acrean government also retired the same amount of carbon, meaning, as one SISA administrator pointed out, the state government really received only US$2.5/ton of avoided emissions.

31 See Mauss, *The Gift*.

32 Newell and Paterson, *Climate Capitalism*; Goldstein, *Planetary Improvement*.

33 BlackRock, "Larry Fink's 2021 Letter to CEOs," accessed March 1, 2023, https://www.blackrock.com/us/individual/2021-larry-fink-ceo-letter.

34 BlackRock, "Larry Fink's 2022 Letter to CEOs: The Power of Capitalism," accessed March 1, 2023, https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter.

35 Redford, Padoch, and Sunderland, "Fads, Funding, and Forgetting"; Fletcher et al., "Questioning REDD+," 673; Angelsen et al., "Learning from REDD+."

36 See INPE, "TerraBrasilis," accessed November 13, 2023, http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/rates. See also Casado, Letícia, and Ernesto Londoño, "Under Brazil's Far-Right Leader, Amazon Protections Slashed and Forests Fall," *New York Times*, July 28, 2019; and Escobar, "Deforestation in the Amazon."

37 An increasing number of large companies are pursuing low-carbon or zero-carbon strategies, many of which rely upon offset purchases in the voluntary carbon market, as documented in Ecosystem Marketplace's

annual *State of the Voluntary Carbon Market* reports. Stephen Donofrio et al., "Voluntary Carbon and the Post-pandemic Recovery," Ecosystem Marketplace, September 21, 2020, https://www.forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2020-2/; Stephen Donofrio et al., "Markets in Motion: State of the Voluntary Carbon Markets 2021," Ecosystem Marketplace, September 15, 2021, https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-markets-2021/; Stephen Donofrio, Christopher Daley, and Katherine Lin, "The Art of Integrity: State of the Voluntary Carbon Market 2022," Ecosystem Marketplace, accessed March 7, 2023, https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-markets-2022/. In an analysis of 482 large companies with some kind of carbon neutrality pledge, Kreibich and Hermwille found that "offsetting will be a key strategy" for these companies. Kreibich and Hermwille, "Caught in Between," 942. These companies' revenues totaled more than US$16 trillion, which is more than the GDP of China. The value of the voluntary carbon market increased to almost US$2 billion in 2021, almost four times its 2020 value. Donofrio, Daley, and Lin, "The Art of Integrity." About 30 percent of carbon offsets sold in the voluntary market in 2020 were from forest protection, up from 10 percent five years previously. World Economic Forum, "Nature and Net Zero," accessed July 1, 2022, https://www3.weforum.org/docs/WEF_Consultation_Nature_and_Net_Zero_2021.pdf.

New, and often linked, organizations and standards have been created to facilitate these transactions, including the REDD+ Environmental Excellence Standard. See Architecture for REDD+ Transactions, "Our Standard," accessed November 13, 2023, https://www.artredd.org/trees/; Emergent, "Protecting Forests, Beyond Net Zero," accessed November 13, 2023, https://www.emergentclimate.com; the LEAF Coalition, "Uniting to Protect Tropical Forests," accessed November 13, 2023, https://leafcoalition.org.

38 On "forest bonds," see Climate Bonds Initiative, "Forestry, Land Conservation and Forestry," accessed November 13, 2023, https://www.climatebonds.net/resources/publications/forest-bonds/.

At COP 26 in Glasgow, Scotland, in 2021, international leaders from twelve countries pledged US$12 billion in public funding to "support work to protect, restore and sustainably manage forests," to be delivered between 2021 and 2025 via the Glasgow Leaders' Declaration on Forests and Land Use. UN Climate Change Conference UK 2021, "The Global Forest Finance Pledge," February 11, 2021, https://ukcop26.org/the-global-forest-finance-pledge/. The "Leaders' Declaration" also included US$7.2 billion in investments from private corporate and philanthropic funds. Aruna Chandrasekhar and Giuliana Viglione, "COP26: Key Outcomes for

Food, Forests, Land Use and Nature in Glasgow," CarbonBrief, November 17, 2021, https://www.carbonbrief.org/cop26-key-outcomes-for-food-forests-land-use-and-nature-in-glasgow/. These COP 26 commitments echoed similar past pledges that largely went unfulfilled. Julia P. G. Jones, "Deforestation: Why COP26 Agreement Will Struggle to Reverse Global Forest Loss by 2030," *The Conversation*, November 2, 2021.

In 2019, California's Air Resources Board adopted the Tropical Forest Standard, creating a legal pathway for some tropical forest carbon offsets to potentially be admitted into the state's cap-and-trade market. California Air Resources Board, "California Tropical Forest Standard," September 19, 2019, https://ww2.arb.ca.gov/our-work/programs/california-tropical-forest-standard. The UNFCCC negotiations at COP 26 left open the possibility that REDD+ emissions reductions from 2021 onward could be included in UN-sanctioned carbon markets under Article 6 of the 2015 Paris Agreement. Chandrasekhar and Viglione, "COP26: Key Outcomes."

39 Emergent, Forest Trends, UN Environment Programme, and Environmental Defense Fund, "Why Large-Scale Forest Protection Must Urgently Be Part of Corporate Climate Mitigation Strategy: How the Jurisdictional Approach to Emission Reduction Crediting Unlocks Transformational and Systemic Change," July 2021, 5, https://www.emergentclimate.com/wp-content/uploads/2021/07/Jurisdictional-White-Paper-1.pdf.

40 Jessica Brice and Michael Smith, "The Amazon Is Fast Approaching a Point of No Return," *Bloomberg News*, July 29, 2021; Paulo Trevisani and Timothy Puko, "Brazil's Climate Overture to Biden: Pay Us Not to Raze Amazon," *Wall Street Journal*, April 21, 2021.

41 Chandrasekhar and Viglione, "COP26: Key Outcomes"; Jennifer Ann Thomas, "Analysis: With New Law, Brazil Seeks to Boost Payments for Protecting Nature," *Reuters*, March 25, 2021.

42 At COP 28, which took place in Dubai in 2023, for example, the Acrean government signed a "term sheet" with Emergent to "supply up to 10 million high-integrity forest carbon credits . . . for years 2023–2026." Emergent, "Acre Leads the Way in Brazil with the First LEAF Coalition Term Sheet," December 5, 2023, https://emergentclimate.com/wp-content/uploads/2023/12/Acre-is-the-first-Brazilian-State-to-sign-a-LEAF-Term-Sheet.pdf.

43 Callon, "Civilizing Markets."

44 Several critical scholars in Acre, including Maria de Jesus Morias, in *Acreanidade*, and Elder Andrade de Paula, in *(Des)envolvimento Insustentável na Amazônia Ocidental*, offer critical analyses of the Acrean government's forest-based governance strategies. Some nongovernmental groups and activists in Acre have also been highly critical. The 2021

"Letter in Defense of the Amazon and Mother Earth, against the Invasion of Capital, Extreme Violence and Green Scams," for example, is a letter signed by almost one hundred people from Acre and outside of it (and translated into English). The letter states that "programs and projects—of 'sustainable development' and of a 'green economy'—presented as though they are 'solutions' for us, for the forests and the world's climate, exert indirect, yet no less severe, violence [than the 'fascist policies of the current Brazilian president'] such that they restrict our traditional coexistence with the forest, placing at risk our cultural and spiritual survival and threatening our food sovereignty, our ways of life and our relation with the territories." "Letter in Defense of the Amazon and Mother Earth, against the Invasion of Capital, Extreme Violence and Green Scams," 2021, accessed November 1, 2023, https://wrm.org.uy/wp-content/uploads/2021/06/Carta-Defesa-Amazonia_EN.pdf. See also CIMI, "Do$$iê Acre: O Acre que os mercadores da natureza escondem," 2012, accessed November 1, 2023, http://www.cimi.org.br/pub/Rio20/Dossie-ACRE.pdf; "Open Letter to California," 2013, accessed November 1, 2023, https://1bps6437gg8c169io y1drtgz-wpengine.netdna-ssl.com/wp-content/uploads/2018/10/Open_Letter_Acre_english_portugese_spanish.pdf; "Xapuri Declaration," May 28, 2017, https://wrm.org.uy/actions-and-campaigns/xapuri-declaration-may-28-2017/.

45 Even if seemingly technical processes of monitoring, reporting, and verification are reliable, deforestation halted in one place might just *leak* somewhere else. Then there is the issue of *additionality*: perhaps emissions would have declined regardless of any intervention, making any emissions reductions nonadditional. And what of the future—who is to say whether a forest protected today will burn tomorrow? This issue is known as *permanence*.

46 For example, Böhm, Misoczky, and Moog, "Greening Capitalism?"; and McAfee, "Selling Nature to Save It?" To the extent that REDD+ enables continued emissions either directly, via carbon offset sales, or indirectly, as a climate mitigation strategy, it is subject to the critique that it enables continued harms from fossil fuel extraction, transportation, and usage—harms that often disproportionately impact marginalized communities and have been the subject of environmental justice critiques and activism. See, for example, Tamra Gilbertson, "Carbon Pricing a Critical Perspective for Community Resistance," Climate Justice Alliance and the Indigenous Environmental Network, October 2017, https://www.ienearth.org/wp-content/uploads/2017/11/Carbon-Pricing-A-Critical-Perspective-for-Community-Resistance-Online-Version.pdf.

47 Fairhead, Leach, and Scoones, "Green Grabbing"; Lund et al., "Promising Change, Delivering Continuity"; Lyons and Westoby, "Carbon

Colonialism and the New Land Grab"; Wittman, Powell, and Corbera, "Financing the Agrarian Transition?" As Adam Bumpus and Diana Liverman write, "By enlisting the help of the developing world, international offsets not only provided a spatial fix for capital entities that were mandated to make emissions reductions, but also opened new channels of finance that allowed capital to create cheap carbon credits in the South and sell them into Northern markets where emissions reduction activities were more expensive." Bumpus and Liverman, "Accumulation by Decarbonization," 213. See also McAfee, "Contradictory Logic."

48 See Harvey, *New Imperialism*; Nichols, *Theft Is Property!*; West, *Dispossession and the Environment*; and Luxemburg, *Accumulation of Capital*. REDD+ has been charged with causing and/or exacerbating divisions between and within Indigenous and other forest communities, with some supporting and some opposing it. Relatedly, there is concern about consent processes undertaken as part of REDD+ development. See Lansing, "Realizing Carbon's Value"; Lyons and Westoby, "Carbon Colonialism and the New Land Grab"; McAfee, "Contradictory Logic"; and Myers et al., "Messiness of Forest Governance." See also Lisa Song and James Temple, "The Climate Solution Actually Adding Millions of Tons of CO2 into the Atmosphere," *ProPublica*, April 29, 2021; Tamra Gilbertson, "Carbon Pricing."

49 Audre Lorde's famous warning that "the master's tools will never dismantle the master's house" could certainly be used in this critique of green capitalism. Lorde, *Master's Tools Will Never Dismantle the Master's House*.

50 Yanagisako, *Producing Culture and Capital*. See also Appel, *Licit Life of Capitalism*; Laura Bear et al., "Gens: A Feminist Manifesto for the Study of Capitalism," Society for Cultural Anthropology, March 30, 2015, https://culanth.org/fieldsights/gens-a-feminist-manifesto-for-the-study-of-capitalism; Gibson-Graham, *End of Capitalism*; Rofel and Yanagisako, *Fabricating Transnational Capitalism*; Tsing, *Friction*; and Tsing, *Mushroom at the End of the World*. The gens approach to studying capitalism, for example, is "to reveal the constructedness—the messiness and hard work involved in making, translating, suturing, converting, and linking diverse capitalist projects that enable capitalism to appear totalizing and coherent." Bear et al., "Gens: A Feminist Manifesto for the Study of Capitalism."

51 Çalışkan and Callon, "Economization, Part 1," 370.

52 See, for example, Appadurai, *Social Life of Things*; Cook, "Follow the Thing"; Guthman, "Unveiling the Unveiling"; Hartwick, "Geographies of Consumption"; Hudson and Hudson, "Removing the Veil?"; Marcus,

"Ethnography in/of the World System"; and West, *From Modern Production to Imagined Primitive*.

53 Documents themselves, of course, are material texts that can have important effects in the world. See Hetherington, *Guerrilla Auditors*; Hull, "Documents and Bureaucracy"; Hull, *Government of Paper*; and Riles, *Documents*.

54 Payments for emissions reductions are often retrospective and offer compensation for emissions reductions that have already occurred. Offset programs tend to require that carbon be stored for at least a set period of time into the future. Among the institutions the Acrean state worked with to monetarily valorize forest carbon was one created by the SISA law: the Company for the Development of Environmental Services, a public/private company in which the Acrean state was the majority owner. They also needed to work with external institutions like the Markit Global Carbon Index.

55 Harris et al., "Global Maps."

56 Other influential sources also advocated for REDD+ around the same time, including McKinsey consultants and the UK Government's Stern Review. Both similarly positioned it as cost-effective. See McKinsey & Company, *Pathways to a Low-Carbon Economy*; Nicholas Stern, "Stern Review on the Economics of Climate Change," Government of the United Kingdom, October 30, 2006, https://webarchive.nationalarchives.gov.uk/20100407172811/http://www.hm-treasury.gov.uk/stern_review_report.htm.

57 This perceived lack of labor may be part of why ecosystem services such as carbon sequestration, like other aspects of nature and undervalued forms of production and reproduction often performed by women and racialized groups, are often not valued or are undervalued within capitalist economies. See Battistoni, "Bringing in the Work of Nature"; Fraser and Jaeggi, *Capitalism*; Moore, *Capitalism in the Web of Life*; O'Connor, *Natural Causes*; Weeks, *Problem with Work*.

58 The climate crisis also means that even where people are not physically present, forests may be harmed through changing hydrological and other geophysical dynamics.

59 Friedlingstein et al., in "Global Carbon Budget 2022," report emissions from deforestation to be 1.8 ± 0.4 GtC per year between 2012 and 2021, with total anthropogenic emissions averaging 10.8 ± 0.8 GtC per year; Baccini et al., "Tropical Forests Are a Net Carbon Source."

60 Sivaramakrishnan, *Modern Forests*; Agrawal, *Environmentality*; Scott, *Art of Not Being Governed*; Mathews, *Instituting Nature*.

61 Campbell, *Conjuring Property*.

62 As quoted in *Globo Rural*, "Sinal de alerta na Amazônia: o desmatamento volta a crescer." *Globo Rural*, June 17, 2014. The man had received deforestation fines for R$30 million, about US$15 million at the time.

63 See Campbell, *Conjuring Property*; Hoelle, *Rainforest Cowboys*.

64 On the standardization of carbon and other commodities, see, for example, Cronon, *Nature's Metropolis*; Castree, "Commodifying What Nature?"; Dalsgaard, "Commensurability of Carbon"; Dempsey and Robertson, "Ecosystem Services"; Gifford, "'You Can't Value What You Can't Measure'"; Huber, "Resource Geographies I"; Knox-Hayes, "Spatial and Temporal Dynamics of Value in Financialization"; Lansing, "Realizing Carbon's Value"; Lohmann, "Marketing and Making Carbon Dumps"; Lovell, "Climate Change, Markets and Standards"; Lovell and Liverman, "Understanding Carbon Offset Technologies"; MacKenzie, "Making Things the Same"; Mathews, "Scandals, Audits, and Fictions"; Osborne, "Tradeoffs in Carbon Commodification"; Osborne and Shapiro-Garza, "Embedding Carbon Markets"; Robertson, "Nature That Capital Can See"; Robertson, "Measurement and Alienation"; Rodrigues Machaqueiro, *Carbon Calculation*; Whitington, "Carbon as a Metric of the Human."

65 MacKenzie, "Making Things the Same." There are six other greenhouse gases that can be converted into tCO_2e based on their "global warming potential." Deforestation can be translated into tCO_2e based on studies of how much carbon a given area of forest sequesters. This work is complex and entails making estimates about forests whose species composition and ecology is often not fully understood. For example, scientists from the academic and governmental institutions in Acre worked to estimate aboveground carbon stocks in the state based on studies conducted in a state forest not far from Rio Branco called Antimary. Using sampling, allometric and statistical methods, and tree species data, they estimated carbon sequestration throughout the state. For an article on this approach to estimating carbon stocks in Acre, see Salimon et al., "Estimating State-Wide Biomass Carbon Stocks." This work was largely beyond the scope of my research but is an important part of forest carbon's commodification.

66 Bridge, "Resource Geographies 1," 821; Whitington, "Carbon as a Metric of the Human"; Dalsgaard, "Commensurability of Carbon," 83.

67 See Dalsgaard, "Commensurability of Carbon," "Carbon Value between Equivalence and Differentiation," and "Carbon Valuation."

68 Marigo et al., "Carbon Star Formation."

69 Dalsgaard, "Commensurability of Carbon," 82. Dalsgaard goes on to argue that carbon's "commodification refers to the physical transformation from one form to another—typically fossil fuel to greenhouse gas."

70 Levi, *Complete Works of Primo Levi*, 940.

71 Popularized in the 1980s, the term *socioenvironmental* is often linked to the rubber tapper movement in Acre and then to the Government of the Forest that was elected in the state in 1998.

72 Besky and Blanchette, "Introduction," 11.

73 Following Polanyi, in *Great Transformation*, Osborne and Shapiro-Garza, in "Embedding Carbon Markets," 91, position forest carbon as a "fictitious commodity," like land, labor, and money, to reveal the contradictions inherent in efforts to commodify it. See also Brockington, "Ecosystem Services and Fictitious Commodities"; and Lohmann, "Uncertainty Markets and Carbon Markets."

74 Indigenous people and their territories have often been particularly effective at protecting forests, research shows, but they need more support and land because they are often impacted by violence and deforestation linked to mining and other incursions. See Barber et al., "Roads, Deforestation, and the Mitigating Effect"; Nepstad et al., "Inhibition of Amazon Deforestation"; Ricketts et al., "Indigenous Lands, Protected Areas"; Soares-Filho et al., "Role of Brazilian Amazon Protected Areas"; W. S. Walker et al., "Role of Forest Conversion, Degradation, and Disturbance."

75 Bear et al., "Gens." Marxist scholarship on commodity fetishism shows how commodification can mask capitalism's constitutive relations. Marx, *Capital*, chapter 1. See also Castree, "Commodity Fetishism." Feminist scholars have shown the broad range of relationships on which capitalism relies. See, for example, Battistoni, "Bringing in the Work of Nature"; Federici, "Social Reproduction Theory"; Fraser and Jaeggi, *Capitalism*; Weeks, *Problem with Work*. These relations often involve nonhuman species as well, as work in multispecies ethnography has explored, often drawing on Indigenous understandings of relations between humans and other-than-humans. See, for example, Besky and Blanchette, *How Nature Works*; Chao, *In the Shadow of the Palms*; de la Cadena, *Earth Beings*; Kirksey and Helmreich, "Emergence of Multispecies Ethnography"; Kohn, *How Forests Think*; Miller, *Plant Kin*; Ogden, Hall, and Tanita, "Animals, Plants, People, and Things"; D. B. Rose, *Wild Dog Dreaming*; Tsing, *Mushroom at the End of the World*; Tsing et al., *Arts of Living on a Damaged Planet*.

76 Other scholars have also highlighted the role of different types of relations, such as property relations, within REDD+ and/or have taken an ethnographic approach to studying forest carbon. See, for example, Mahanty et al., "Unravelling Property Relations around Forest Carbon"; McAfee and Shapiro, "Payments for Ecosystem Services in Mexico"; Milne, "Grounding Forest Carbon"; Milne and Adams, "Market Masquerades"; Milne et al., "Learning from 'Actually Existing' REDD+"; Osborne,

"Tradeoffs in Carbon Commodification"; and Osborne and Shapiro-Garza, "Embedding Carbon Markets."

77 Anthropologists and other scholars have examined infrastructure's (including roads') (in)visibility, temporality, affect, links with conceptions of progress, and exclusions. See, for example, Anand, *Hydraulic City*; Anand, Gupta, and Appel, *Promise of Infrastructure*; Dalakoglou and Harvey, *Roads and Anthropology*; Harvey and Knox, "Enchantments of Infrastructure"; Harvey and Knox, *Roads*; Hetherington, "Waiting for the Surveyor"; Hetherington, "Surveying the Future Perfect"; Hetherington, *Infrastructure, Environment, and Life in the Anthropocene*; Hetherington and Campbell, "Nature, Infrastructure, and the State"; Knox, "Affective Infrastructures and the Political Imagination"; Larkin, *Signal and Noise*; and Star, "Ethnography of Infrastructure."

78 Tropical forest regions, in other words, have been important in creating REDD+ and other forest policies, not just implementing ideas created outside of them, just as other locations in the Global South have been sites of science and technology innovation, creativity, and agency. See, for example, Cribelli, *Industrial Forests and Mechanical Marvels*; Greenleaf et al., "Forest Policy Innovation at the Subnational Scale"; Laveaga, *Jungle Laboratories*; Medina, Marques, and Holmes, "Introduction: Beyond Imported Magic"; and Pollock and Subramaniam, "Resisting Power, Retooling Justice."

79 Instituto Brasileiro de Geografia e Estatística (IBGE), "Cidades e Estados," accessed November 1, 2023, https://www.ibge.gov.br/cidades-e-estados/ac.html.

80 For more on the history and present of Indigenous people in Acre, see, for example, Apurinã, *Nos caminhos da BR-364*; lglesias, *Kaxinawá de Felizardo*; and Matos, "A Comissão Pró-Índio do Acre e as línguas indígenas acreanas." Before colonization, there were about fifty Indigenous communities—belonging to the Pano, Aruak, and Arawá linguistic families (including the Huni kuĩ, Apurinã, and Yawanawa)—in what would become Acre.

That so many Acreans do not identify as Indigenous speaks to larger processes of erasure (*apagamento*) in Brazil. See Gabriel Andrade, "Precisamos falar sobre o apagamento de identidades indígenas no Brasil," *TODXS* (blog), March 21, 2021, https://medium.com/todxs/precisamos-falar-sobre-o-apagamento-de-identidades-ind%C3%ADgenas-no-brasil-2797bd37ce1f; and Miki, *Frontiers of Citizenship*. Interestingly, though, according to the census, the percentage of Acreans identifying as Indigenous has increased substantially in recent years. O Globo, "Censo 2022: Acre tem quase 32 mil indígenas e mais de 60% ainda vivem em áreas delimitadas," August 7, 2023, https://g1.globo.com/ac/acre/noticia

/2023/08/07/censo-2022-acre-tem-quase-32-mil-indigenas-e-mais-de-60percent-ainda-vivem-em-areas-delimitadas.ghtml.

81 For deforestation data in Acre, see INPE, "PRODES: Desmatamento no Municípios," accessed November 13, 2023, https://www.dpi.inpe.br/prodesdigital/prodesmunicipal.php.

82 In most cases, the term *state forest* does not refer to publicly owned forest, but rather to forest located within Acre. This forest may be in state-designated protected areas, Indigenous territories, privately owned lands, or land without clear ownership.

83 For discussions of resource frontiers see, for example, Cons and Eilenberg, *Frontier Assemblages*; and Rasmussen and Lund, "Reconfiguring Frontier Spaces." For discussions of how the Amazon has been imagined, see, for example, Bunker, *Underdeveloping the Amazon*; Slater, *Entangled Edens*; Slater, "Visions of the Amazon"; Viveiros de Castro, "Images of Nature and Society."

84 Krenak, *Ideas to Postpone the End of the World*.

85 Capitalism, of course, has always relied on regions figured as peripheral, many of them through ongoing forms of colonialism. See Mignolo, "Introduction."

86 In the hopes of securing a United States–controlled source of rubber, powerful American companies and the US government secretly allied with Bolivian interests against Brazil in the late nineteenth century. Hecht, *Scramble for the Amazon*. The implicit aim was for Acre "to become an American colony, in fact if not in name." Hecht and Cockburn, *Fate of the Forest*, 83.

87 Hecht and Cockburn, *Fate of the Forest*, 80.

88 Deforestation is not unique to Brazil, of course. While humans have long used trees for fuel and cleared forest to make space for cultivation, recent deforestation has been of a different scale and order often as a part of large-scale processes of colonialization and capitalism. See Williams, *Deforesting the Earth*.

89 For example, in the twentieth century, President Getúlio Vargas (1930–1945, 1951–1954) promoted a "March to the West" to consolidate rule in central Brazil. Garfield, *Indigenous Struggle at the Heart of Brazil*. The subsequent government constructed a fabricated and centrally located city, Brasília, and moved the federal capital there from coastal Rio de Janeiro. Holston, *Modernist City*.

90 This deforestation-dependent development entailed the creation of extensive infrastructure, property and tax policies, concessions, settlements, credits, and subsidies, much of which was administered by a troubled bureaucracy. Alston, Libecap, and Mueller, *Titles, Conflict, and Land*

Use; Becker, *Amazônia*; Bunker, *Underdeveloping the Amazon*; Costa, *Formação agropecuária da Amazônia*; Hecht, "Logic of Livestock and Deforestation"; Moran, *Developing the Amazon*; Hecht and Cockburn, *Fate of the Forest*; Schmink and Wood, *Contested Frontiers in Amazonia*. The Amazon region has been the focus of particular governmental angst in Brazil. Portuguese and Brazilian states gained official control of much of the region through treaties with other imperial governments and post-colonial states. But it was such a large area (almost 60 percent of Brazil's territory), so densely forested and so sparsely populated by Brazilians, that it was difficult to govern. The Amazon, and its abundance of species, was also the subject of significant and often avaristic interest from outsiders. Scientists, adventurers, and prospectors, as well as neighboring countries and competing imperial powers, sought to claim its resources and territory, causing officials and the military ongoing unease about Brazilian sovereignty there. Hecht, *Scramble for the Amazon*; Hecht and Cockburn, *Fate of the Forest*.

91 See, for example, Aldrich et al., "Contentious Land Change."

92 See Slater, *Entangled Edens*.

93 "Paradise Lost" is, of course, the name of John Milton's epic biblical poem about the "fall of man." As Susanna Hecht, in *Scramble for the Amazon and the "Lost Paradise" of Euclides da Cunha*, explores, "Lost Paradise" is also the name of the unfinished work about the Amazon by Brazilian journalist and writer Euclides da Cunha (1866–1909; he was killed before he could complete the piece). It was based in part on da Cunha's visit to Acre in the early 1900s on behalf of the Brazilian government, which wanted to justify its 1903 annexation of Acre against Peruvian ownership claims. Da Cunha wrote that Acre's Brazilian migrant rubber tappers "reclaimed their national heritage in a novel and heroic way, extending the fatherland to the new territories they occupied." As quoted in Hecht, *Scramble for the Amazon*, 446. As this indicates, the Amazonian frontier has served as an important space of Brazilian nation-building.

94 See Cons, "Ecologies of Capture."

95 Brum, in *Banzeiro Òkòtó*, describes the Amazon as the center of the world not only because of its centrality to climate stability but also because the Amazon is one of the frontlines of the climate crisis and those of us from outside of it have a lot to learn from the forest and those who live there.

96 Kainer et al., "Experiments in Forest-Based Development"; Morais, *Acreanidade*; Schmink, "Forest Citizens"; Schmink et al., "Forest Citizenship in Acre, Brazil."

97 As quoted in Kainer et al., "Experiments in Forest-Based Development," 870.

98 Schmink, "Forest Citizens," 151.

99 As quoted in Morais, *Acreanidade*, 202–3.

100 Hetherington, "Waiting for the Surveyor," 196.

101 The Government of the Forest was replaced with an allied state government in 2011.

102 See IMC, "Programa para pioneiros em REDD+ (REM)," accessed June 15, 2022, http://imc.ac.gov.br/programa-para-pioneiros-em-redd-rem/.

103 Roseneide Sena, "Acre celebra 10 anos do Programa REM, primeiro instrumento de pagamento por resultados e de repartição justa de benefícios - Programa REM Acre - Fase II," Government of Acre, July 2022, https://programarem.ac.gov.br/2022/07/01/acre-celebra-10-anos-do-programa-rem-primeiro-instrumento-de-pagamento-por-resultados-e-de-reparticao-justa-de-beneficios/. This number may include money raised via SISA more generally—a number that the former director of the IMC put at R$200 million. Brasilamaz, "Candidaturas aos governos na Amazônia Legal prometem inserção no mercado de carbono—Brasil Amazônia Agora," September 12, 2022, https://brasilamazoniaagora.com.br/2022/amazonia-mercado-de-carbono/.

104 To develop and implement SISA, the Acrean government worked with a number of outside institutions and actors, including transnational collaborations such as the Governors' Climate and Forest Taskforce, NGOs both large and small (such as the World Wildlife Fund), and carbon credit certification programs, like that offered by the Climate, Community, and Biodiversity Alliance.

105 See Greenleaf et al., "Forest Policy Innovation at the Subnational Scale."

106 Indigenous people are important to protecting the Amazonian forest and keeping its carbon sequestered, with deforestation often linked to violence against them. Walker and colleagues, for example, estimate that more than a third of the Amazon's aboveground carbon is located in Indigenous territories, where deforestation rates are often lower than outside of them. Walker et al., "The Role of Forest Conversion, Degradation, and Disturbance." Indigenous peoples have also been important players in the Acrean effort to value the forest. Some of them supported SISA, and some vehemently opposed it. "Letter in Defense of the Amazon and Mother Earth." This echoes a history of uneven Indigenous engagement with and benefits from the Acrean government. See Apurinã, *Nos caminhos da BR-364*. Some Indigenous Acreans received KfW-funded benefits, including stipends for Indigenous environmental agroforestry agents, training of new Indigenous agents, monetary grants to community organizations to, among other things, implement "ethno-management plans," "overall support" for many Indigenous territories,

and funding to develop an institutional structure within SISA that would enable Indigenous participation. KfW, "REDD Early-Movers Acre Fact Sheet." This structure included the Indigenous Peoples Working Group (GTI), composed of Indigenous Acreans. The group helped to design the ISA-Carbono Indigenous subprogram (which received €3 million of KfW funding) and provided other guidance about how to implement SISA. Maria DiGiano et al., "The Twenty-Year-Old Partnership between Indigenous Peoples and the Government of Acre, Brazil: Lessons for Realizing Climate Change Mitigation and Social Justice in Tropical Forest Regions through Partnerships between Subnational Governments and Indigenous Peoples," Earth Innovation Institute, September 2018, https://earthinnovation.org/uploads/2018/09/Acre_EN_online.pdf.

107 Duchelle et al., "Acre's State System of Incentives." The mucuna seeds were black mucuna (*Mucuna aterrima*).

108 See Hetherington, *Government of Beans*, for a discussion of the imagined role of cotton in securing rural campesino citizenship in twentieth century Paraguay, for example. As Hetherington writes, "Perhaps most importantly . . . [cotton] kept the promise itself alive that one day Paraguay's rural poor would be able to count on a state that provided for their welfare as citizens." Hetherington, *Government of Beans*, 20.

109 As quoted in Repórter Brasil 20 anos, "Acre against Chico Mendes," *Repórter Brasil*, October 26, 2017, https://reporterbrasil.org.br/2017/10/acre-against-chico-mendes/.

110 Rentier state theory posits that the ability to sell resources, like oil, means that states do not have to rely as much on domestic taxation and therefore do not need to promote economic development. See Beblawi and Luciani, *Rentier State*.

111 See Mathews, *Instituting Nature*; Sivaramakrishnan, *Modern Forests*.

112 Li, "Practices of Assemblage," 266.

113 Agrawal, *Environmentality*.

114 Amaral and Burity, *Inclusão social, identidade e diferença*; and Ansell, *Zero Hunger*. For a critical analysis of the use of the concept of social inclusion in Brazil, see Meyer et al., "Políticas Públicas." Inclusion was also emphasized by other left-wing Latin American governments that governed around the same time. Balán and Montambeault, *Legacies of the Left Turn in Latin America*.

115 Partido de Trabalhadores, "Lula: 'Nossa política de inclusão foi muito mais que o Bolsa Família,'" Partido dos Trabalhadores, August 11, 2021, https://pt.org.br/lula-nossa-politica-de-inclusao-foi-muito-mais-que-o-bolsa-familia/.

116 On petro-states, see Appel, Mason, and Watts, *Subterranean Estates*; Coronil, *Magical State*; Karl, *Paradox of Plenty*; Mitchell, *Carbon Democracy*; Lu, Valdivia, and Silva, *Oil, Revolution, and Indigenous Citizenship*; and Lyall and Valdivia, "Speculative Petro-State."

117 Ferguson, *Give a Man a Fish*, 3 (emphasis in the original).

118 Foucault, "*Society Must Be Defended*," 241.

119 Mitchell, *Carbon Democracy*.

120 As Timothy Mitchell explores in *Carbon Democracy*, "carbon energy" production and circulation as fossil fuels has shaped democratic institutions and practices, social movements, and politics. The two kinds of carbon democracies are linked. The forest carbon form of carbon democracy formed as a market-based response to the fossil fuel type that Mitchell analyzes. Sequestered carbon only has monetary value because extracted carbon has been so valuable.

121 For critical engagement with resource determinism and "the resource curse," see Appel, "Toward an Ethnography of the National Economy"; Appel, Mason, and Watts, *Subterranean Estates*; Barry, *Material Politics*; Gilberthorpe and Rajak, "Anthropology of Extraction"; Watts, "Resource Curse?"; Mitchell, *Carbon Democracy*; and Weszkalnys, "Cursed Resources."

122 See Cavanagh and Benjaminsen, "Virtual Nature, Violent Accumulation"; Dehm, "Indigenous Peoples and REDD+ Safeguards"; Dunlap and Fairhead, "Militarisation and Marketisation of Nature"; Jodoin, *Forest Preservation in a Changing Climate*; Lyons and Westoby, "Carbon Colonialism and the New Land Grab"; Milne et al., "Learning from 'Actually Existing' REDD+"; Osborne, "Tradeoffs in Carbon Commodification"; Sarmiento Barletti and Larson, *Rights Abuse Allegations*; Sarmiento Barletti and Larson, "Environmental Justice in the REDD+ Frontier." As Juan Pablo Sarmiento Barletti and Anne Larson put it in "Environmental Justice in the REDD+ Frontier," 168, "Currently victories in terms of justice for indigenous and local populations in relation to REDD+ cannot be attributed to its design but rather occurred because social movements have been able to strategically and creatively make gains within the context of REDD+ negotiations, preparation or readiness, and implementation."

123 See Porter and Craig, "Third Way and the Third World"; McAfee, "Contradictory Logic."

124 Since the European invasion of the "New World," the Amazon has been a place for adventurers and prospectors to invoke and travel to for divergent reasons, including, for example, to seek territory to reestablish US Confederacy–style slavery, chase after redemptive adventure, and pursue

dreams of riches. See, for example, Millard, *River of Doubt*; Raffles, *In Amazonia*; Slater, *Entangled Edens*.

125 Haraway, "Situated Knowledges," 581.

126 Jennifer Watling and colleagues found that geoglyphs on approximately thirteen thousand km² in Acre were built "within anthropogenic forest that had been actively managed for millennia." Watling et al., "Impact of Pre-Columbian 'Geoglyph' Builders," 1868. For research on Indigenous Amazonian cultivation within and outside of forests, see, for example, Balée, "Indigenous Transformation of Amazonian Forests"; Glaser and Woods, *Amazonian Dark Earths*; Iriarte et al., "Origins of Amazonian Landscapes"; Neves and Heckenberger, "Call of the Wild"; Parker, "Forest Islands and Kayapó Resource Management in Amazonia"; and Posey, "Indigenous Knowledge, Biodiversity, and International Rights."

127 Raffles, *In Amazonia*, 34.

128 See Secretaria de Estado de Planejamento, "Evolução da população, taxa de urbanização e crescemento populacional—Acre," accessed October 30, 2021, https://seplan.ac.gov.br/evolucao-da-populacao-taxa-de-urbanizacao/. Many of these urban residents were migrants from rural areas or their descendants. Schmink and Cordeiro, *Rio Branco*.

129 For more detail on CIFOR's Global Comparative Study on REDD+, see CIFOR, "CIFOR's Comparative Study on REDD+," accessed October 30, 2021, https://www2.cifor.org/gcs/.

130 All names used in this book are pseudonyms, unless the person I am writing about is a public figure. Fernanda was tremendously helpful during this part of my research, assisting with asking questions and taking notes. I also hired someone to drive us in rural areas where I was advised that it was not safe for me to travel on my own. These concerns stemmed in part from the 2006 rape and murder of a female PhD student in the area.

131 Relatedly, I was sometimes told about Acre's heritage as being a balanced mixture of all Brazilians, and Acreans not having an accent because of it, echoing entrenched Brazilian tropes about the country as a "racial democracy." See Freyre, *Masters and the Slaves*. This myth mixed discourse positing racial "mixing" as a path to a superior tropical civilization with entrenched and violent racism that benefited white Brazilians and harmed racialized Brazilians, including Black and Indigenous people. See Miki, *Frontiers of Citizenship*; Mitchell, *Constellations of Inequality*; Nascimento, "Myth of Racial Democracy"; and Twine, *Racism in a Racial Democracy*.

132 The fact that smallholders were often current or former rubber tappers, or descendants of them, meant that they have been thought of

and organized as rural workers, rather than peasants. Martins, "Representing the Peasantry?" The figure of the worker is a socioculturally powerful category in Brazil in part because of the way that President Getúlio Vargas made formal, waged workers the centerpiece of early- to mid-twentieth-century welfare state policies. See Fischer, *Poverty of Rights*; Holston, *Insurgent Citizenship*; and Millar, *Reclaiming the Discarded*.

133 This might have been different in rubber tapper movement strongholds like Xapuri, the historic center of the rubber tapper movement, of which the Xapuri Rural Workers Union was an important part. For more on rural workers unions, see Welch and Sauer, "Rural Unions and the Struggle for Land in Brazil."

134 Hoelle, *Rainforest Cowboys*.

135 Adams et al., *Amazon Peasant Societies in a Changing Environment*; Nugent, *Amazonian Caboclo Society*; Pacheco, "Smallholder Livelihoods"; Vadjunec, Schmink, and Greiner, "New Amazonian Geographies."

136 See Rojas, Olival, and Olival, "Cultivating Alternatives."

137 On the anthropology of roads, see Dalakoglou and Harvey, *Roads and Anthropology*; Harvey and Knox, *Roads*; Jobson, "Road Work."

138 See, for example, Barber et al., "Roads, Deforestation, and the Mitigating Effect"; Fearnside, "Desmatamento na Amazônia"; Ferrante and Fearnside, "Amazon's Road to Deforestation"; Nelson and Hellerstein, "Do Roads Cause Deforestation?"

139 The idea of extending the BR-364 so that it continues all the way to Peru and the Pacific Ocean has circulated for decades and was revived under the presidency of Jair Bolsonaro, despite concerns that doing so would threaten local Indigenous and forest communities and the famed biodiversity of the Serra do Divisor National Park. See Fabiano Maisonnave, "Planned Brazil-Peru Highway Threatens One of Earth's Most Biodiverse Places," Mongabay.com, July 22, 2021, https://news.mongabay.com/2021/07/planned-brazil-peru-highway-threatens-one-of-earths-most-biodiverse-places/.

140 Communities like the Kaxarari of Vila Extrena are still waiting for compensation. Apurinã, *Nos caminhos da BR-364*.

141 See Hochstetler and Keck, *Greening Brazil,* 162–165; and Keck, "Social Equity and Environmental Politics in Brazil," 415–417.

142 Anticipating increased deforestation, the government initially made the land along the BR-364 in Feijó a "priority area" for a planned REDD+ project, with money set to flow there. These plans were replaced by SISA's statewide approach. See Duchelle et al., "Acre's State System of Incentives."