Markus Kröger

FRONTIERS OF EXISTENCE: REDEFINING WHO CAN EXIST AND HOW AT RESOURCE FRONTIERS

ABSTRACT

This article introduces a new concept, 'frontiers of existence', to highlight the lives of human and other-than-human beings whose possibilities to exist are extinguished or radically and negatively transformed at resource and commodity frontiers and demand more attention be placed on this. What happens to existences at these places has not been a central focus in prior studies utilizing political economy, political ecology, or other approaches for studying frontiers. This article makes a theoretical contribution by arguing that the research on resource frontiers should recognize more fully the redistributions of existences caused by major landscape changes. The analysis is based on field research since 2004 on the expansion of monocultures and deforestation in Brazil and the effect of this on existences. Four key questions for the existential analysis of frontiers are suggested, and their application is briefly demonstrated through ethnographic material collected in November and December 2019, in the Amazon and Cerrado regions of Mato Grosso State in Brazil.

Keywords: Resource frontiers, ethnocide, deforestation, political ontology, global land grabbing, frontiers of existence, forests

INTRODUCTION

This is a conceptual article that presents theoretical insights based on participant observation at sites of intense commodity frontier expansion in Brazil (principally in the states of Pará, Acre, Maranhão, Bahia, and Mato Grosso). The aim is to add to the literature on resource frontiers, especially in the Amazon, complementing the existing political economic, cultural, and other readings by offering tools to assess the changes to the assemblages of existences when frontiers are expanded. Resource frontiers can be understood as processes of appropriation where colonizers or other extractivist actors physically and dramatically reshape existing landscapes and lived environments. In this article, I examine the (limited number of) beings allowed to exist upon the expanding soybean/corn frontier and the marked absence of other existences as monoculture plantations advance.[1] I suggest the new concept of 'frontiers of existence' to direct more attention within frontier research to an analysis that is centered on how frontiers transform who and what exists in places as

resource frontiers expand. In addition to who and what exists, it is also important to analyze how they exist, and for what time they can exist in these transformed spaces. This new conceptualization is accompanied by four key questions on existences, which help to explore the many dimensions related to existences and beings, and how these are transformed in different spaces when resource frontiers are expanded. This processual view helps in assessing what existed before the frontier expansion, and what still exists on the other side of the frontier. It allows reflection and insight into the forces that change and destroy the existing landscape, including deforestation for pastures or monocultural plantations. It is important to evaluate how these changes are made and what the broader consequences of these landscape transformations are. For example, how is the quality of life for those beings who still live in the area after the transformations, that is, in either the post-frontier space, or the spaces of continued frontier-making? In practice, there are many different scales that one could use to examine these processes; however, in this article, I focus on large-scale resource extraction processes and areas, and the resulting changes in the spectrum of existences.[2]

After reviewing the prior research, methodology, and materials of the study, I will discuss in more detail these transformations, forms of violence, and redistributions of existences as they emerged in the field research.

FRONTIERS AND EXISTENCES: TOWARD A NEW CONCEPTUALIZATION

The concept of the 'frontier' has been salient in many anthropological studies and other literatures that attempt to explain the major social, political economic, and environmental transformations in Brazil, and especially in the Amazon (e.g., Campbell 2015; Hoefle 2013; Nugent 2006). Campbell (2015: 29) identifies the concept of frontier as both necessary and insufficient to describe the transforming Amazonian realities. Campbell (2015) focuses on how the concept, notion, and idea of 'frontier' has been and continues to be present in the developmental schemes of various actors in a particular setting, but less focus is put on what happens at these frontiers in terms of existences, as understood in political ontology. My approach in this article complements prior frontier-studies, which have focused more on culture or other aspects from a perspective that differs from emphasizing existences—that what is transformed in terms of life, and the spectrum of the web of life. As an example, Campbell (2015: 30, emphasis added) has focused on studying the impacts and character of frontier discourses as 'guiding principles in *cultural* life', although he and other frontier-theorists have also to some degree addressed what I call here 'existences'. However, there are marked differences in emphasis within political ontology. For example, there is a common misunderstanding among non-political ontologists that in this type of study ontology is used just as another new word for culture (de la Cadena and Blaser 2018). A key reason for these scholars to depart from 'culture' is to avoid the Western nature-culture/society dualism, and the often-accompanying pejorative or diminutive approaches of framing this or that practice (such as talking about other-than-human beings) as merely 'cultural', that is, as not real or existing, but related to stories, myths, religions, and other categories of lesser value. South American political ontology (de la Cadena 2010; 2015) and the perspectivist study of Amazonian realities (Viveiros de Castro 2012) have criticized the rendering of what they argue to be ontological

differences into mere cultural differences. These strands of anthropology draw on the understandings of Indigenous populations, where, first, it is seen as pejorative and flattening to treat Indigenous worlds and their actors as different 'cultures' instead of taking their claims about what exists seriously. Second, the range of actors is much wider than humans, including other-than-humans, which can, for example, be half-human, half-animal, or more precisely, something in between human and animal (Blaser 2013). Political ontology refers to the broader ontological openings created by the inclusion of these knowledges. These onto-epistemic openings are a distinct project from the so-called ontological turn, which political ontology has criticized for sometimes replacing the word 'culture' with 'ontology' (de la Cadena and Blaser 2018). I build on these theoretical-ontological approaches through a similar suggestion that much more focus needs to be placed on what exists—and is destroyed or transformed in terms of existences—than on the cultural or political economic transformations created by frontiers (which also can and should be studied). I argue that the key issue of frontiers is that they dramatically transform who and what can exist, not that they change or affect cultures (which they also do). Much more attention and focus needs to be given to these transformations, given the mass extinctions of species, loss of unique beings, and ways of being. Thus, my focus complements the prior studies on existences and extinctions (e.g., Van Dooren et al. 2017). A focus on 'culture' is typically anthropocentric; however, when focusing on existences in the broader sense as done herein, there is the possibility to go beyond humans to also include what happens to other beings. A similar kind of approach to this South American political ontology has also been present in some other regions' anthropology, for example in the scholarship on multispecies justice (e.g., Gan et al. 2017). Both approaches share an interest to interrogate in much more detail what exists in a given setting, how they exist, and what relations exist in that assemblage. I also direct attention into what happens when these assemblages are radically transformed by deforestation and the subsequent spread of monoculture plantations.

Prior key criticisms of the frontier concept in the context of the Amazon in anthropology (Cleary 1993; Nugent 2006) have been based on a justified critique that the frontier concept mystifies, blunts, and exoticizes the Amazon. Through this concept, the Amazon is turned into a periphery, which, in concert with the other critiques, serves to hide major temporal and geographical variations and resistances. My take here is akin to the new literature and project of Political Ontology—with capital letters—which focuses on other-than-human beings or processes (de la Cadena and Blaser 2018), unlike in the political science tradition of political ontology, which focuses on agency and structures (see Hay 2006).[3] Political Ontology offers analyses that serve as ontological openings, which broaden prior onto-epistemic logics as a political process. This process opens up the varied ontological worlds (instead of cultural differences), the pluriverse with a multitude of existences, as well as those of other-than-human beings, which can and should be approached from non-anthropocentric perspectives, reflecting and learning from the ontologies of Indigenous and other non-modernist, non-Western populations particularly in South America (Blaser 2013; Viveiros de Castro and Danowski 2018; de la Cadena 2014; de la Cadena and Blaser 2018; Escobar 2020; see also Kröger 2020b for a review and broader situation of this literature). By placing emphasis on all kinds of existences of sentient and other living beings (instead of

focusing only on human lives or cultures), I also participate in the anthropological scholarship on multispecies ethnography (Locke and Muenster 2015; Tsing 2015), which rejects Western and modern notions of human-nature dualisms and offers ontological challenges to many prior studies of commodity frontier expansions that focus on the resource extraction aspect, or political economy.

These expansions can take the form of deforestation for open-pit mining, plantations, dams, or pastures. Drawing on my field research in the Amazon, partially in the same regions that Campbell (2015) studied (in Western Pará), I want to instead emphasize that there are visible and tangible 'frontiers of existence', and to introduce this concept as a way to emphasize how and when political economic expansions constitute a frontier of existence, which wipes out the forest and its multitude of life forms. This understanding is based primarily on my longitudinal and multi-site field research, where I covered most regions of Brazil. I saw how vast areas have been transformed since 2004 into completely unrecognizable landscapes. The change processes have been quick, erasing whole forests in just a few years' time. I observed these changes personally as I re-entered the transformed sites over the years. In my view, these deforestations—and thus existential changes, especially when shifting from forests to endless plantations—are a key issue to be included and considered in the reemerging frontier theorizing. In this view, the use of frontier as a concept can capture the existence of a major, tangible difference in the arrangement of existences before and after the deforestation, and between the deforested and not-deforested areas.

As an approach, employing the concept of frontier to emphasize the spectrum of life forms and the lives of beings that are radically transformed and even annihilated at an astonishing scale and pace mostly sidesteps the classic debate on the extent to which it can be used to describe the Amazon realities. In this debate, anthropologists (e.g., Cleary 1993; Raffles 1999) have emphasized the importance of local knowledge and situated intimacies, critiquing the generalizing frontier theories that were popular in Amazon studies in the 1980s. Before this, world-system theorists (Bunker 1985) also emphasized the role of specific contexts. They also argued that the concept of frontier had not captured specificities well, as it had been used thus far by political economists of the Amazon to make broad and generalizing theories of frontiers and their class and capital formation tendencies (see, e.g., Foweraker 1981). There is a large body of literature on resource frontiers in Brazil that follows this political economy tradition and has a generalizing take on the concept. In this literature, the analytical approach has focused on using 'frontier' as some sort of heuristic tool for analysis, rather than on the 'frontier' as a process of framing or analyzing who makes these frames and why. In these studies, particular attention has been placed on economy and development (e.g., Barbier 2012; Foweraker 1981; Jepson 2006; Martins 1984). There have also been studies on the political ecology of frontier expansion (e.g., Hecht and Cockburn 1989; Schmink and Wood 1992), the governance of frontiers and frontier regions (e.g., Alston et al. 2000; Browder et al. 2008; Nepstad et al. 2002; Nolte et al. 2017), and ethnographies of the 'frontier livelihoods' of 'frontier peasants' (Hoefle 2013). What happens to existences on frontiers has not been a main feature of these prior studies. This article argues that the research on resource frontiers should more fully recognize the extremely important annihilations and redistributions of existences caused by major landscape changes.

This refocusing of attention is especially topical, given the acceleration of extinctions of species and losses of major biomes due to increasing deforestation. For example, in the first nine months of 2020, *one quarter* of the Pantanal biome in Western Brazil was lost due to fires that were purposefully lit by ranchers who wanted to expand their ranching frontier over the world's largest tropical swampland (Rodríguez Mega 2020). This process advanced astonishingly quickly, on a large scale, and is largely irreversible. These actions followed the global price boom for beef, caused by rapidly rising demand for meat in the growing East Asian economies. Following incidents like these fires, the concept of frontiers of existence is needed as a new take in frontier debates, where emphasis can be directly placed on the multitude of lives lost and, most importantly, on the loss of future possibilities of existence for those beings. The uniqueness of this moment in terms of the quality of deaths being caused has been highlighted in studies on extinctions and multispecies justice (Rose 2004). For example, Rose (2011) places emphasis on how more species are now dying than speciation can bring to life, and how the use of poisons to kill living beings transforms the natural cycle of death and life, turning the composing forms of life deadly also after their death for other beings, calling this phenomenon double death. This creates great havoc as it is a widespread erasure of current and future possibilities for life. However, there is a marked focus on the key agent of change with the responsibility being the 'we' of humanity (see Rose n.d.); this indicates a Western approach that is at odds with Amazonian Indigenous peoples and their (non)responsibility in these double deaths. The arrangements of agency, responsibility, and transformations in the relations of the web of life differ depending on the kind of frontier and context in question. The answers vary in different contexts to who is responsible, who are the key agents, and how and what life is transformed. For example, a ranching expansion in the Pantanal differs as a frontier of existence from the expansion of soybean plantations in the Cerrado, or an open-pit mine in the Amazon. They are all frontiers of existence, but they do not have the same assemblages.

Similarly, as the concept of double death—using frontiers of existence as a concept—highlights that what is most at stake are lives. These lives include 'species', understood as habituated relations, whose existence depends on a stable set of relations, which have now been fundamentally challenged for their existence by ecological and climate crises around the world. I argue that the key case and issue with frontiers is to focus on existential changes—not (just) on the 'commodities' or 'resources' extracted. The intention is not to displace prior studies, but rather to complement them. I believe that this approach can be helpful for the anthropological approaches that emphasize situated intimacies and local specifics, as well as for broader political economic analysts, by offering an additional and complementary heuristic lens to add to the existing analytical toolboxes. This approach helps researchers to remember these are processes where actual lives are lost, which is a different perspective than putting emphasis on studying the 'frontier' as a cultural discourse or a developmental process.

METHODS AND MATERIALS

This is a theoretical article, not an ethnographic research article. The aim is to reassess and reorient the current debates. This conceptual contribution stems primarily from my prior field research exposures. Between 2004 and 2019, I spent a total of over two years in the field, at

sites of plantation expansion and deforestation. I focused on the processes that different economic sectors go through when expanding their operations into Brazil's rural and forest areas. I placed particular emphasis on observing the conflicts and related politics of the expansionary moves in multiple-use conservation, tree, soybean, corn and cotton monoculture, ranching, and mining areas. I interviewed hundreds of social actors in key positions (e.g., company personnel, activists, local leaders, bureaucrats, and politicians). Their perspectives were key in shaping the new framing presented in this article. At sites of deforestation, for example, the Indigenous people primarily described the changes as damages to the balance with the guardian spirits of places and other-than-human beings. Indigenous people called the current and recent frontier moves nothing less than ethnocide and ecocide. I also conducted specific interviews *in situ* with a broader group of actors, which focused on the existential aspects of how the locals saw the transformations of the regions. For example, field research was conducted at soybean plantations and pastures in the Amazon with large-scale producers and ranchers, walking with them in these areas and seeing the production in process, and asking questions such as, 'What was here before, and what is here now, and how did you transform this area?' I made similar *in situ* interviews in the Indigenous communities. I asked members of these communities similar questions while in their territories, traveling with them to the places that they wanted to show me. They identified many of these places as having been illegally and violently deforested by outsider speculators and land grabbers. In northern Mato Grosso, the field research I did in 2019 was a quick two weeks, in comparison to the bulk of the ethnography that underpins the theorizing in this article. Here, this field research functions mostly as a prerequisite in the background, having given rise to the theoretical insights about the importance of understanding changes through the lens of frontiers of existence. While the focus here is conceptual, I will also draw on quotes from some interview situations in November and December 2019.

CONCEPTUALIZING AND SITUATING 'FRONTIERS OF EXISTENCE'

There are major existential impacts when an area, which is also the home for particular people and other beings, is framed as a 'resource frontier' by the government and colonizers. The northern parts of the state of Mato Grosso in Brazil, like the rest of the Brazilian Amazon, were framed as a 'resource frontier' by the government in the 1970s (Marques 2007). The concept of 'resource frontier' was widely used as an administrative and political tool by the Brazilian dictatorship prior to its adaptation as an academic concept. Being classified as a resource frontier by the state has meant that the inhabitants of the area, including other-than-humans, began to be decimated in great numbers, and their lived environments were radically altered and diminished. This has especially been the case when many parts of the Amazon were designed as resource frontiers in a relatively short period of time. Yet, the surviving Indigenous people do not see their home regions through this onto-epistemology of 'resource frontier'. The 'resource frontier' designation is not helpful to understand that there are actual lives at stake when a region is transformed according to the policy designation of a resource frontier. Instead, that concept emphasizes 'resources'—a choice of vocabulary whose often unrecognized world-making political role is made more apparent through the onto-epistemological approach

of Political Ontology. It is at this juncture that the concept of frontier of existence is helpful, as it offers a more precise and broader explanation of what happens in these spaces in terms of lives, beyond the typical political economic analyses. When a forest gets burned down or is otherwise destroyed and replaced with pastures or a monoculture plantation, the nature of the existences in that place are fundamentally shifted. In other words, a being which previously existed in relation to an area—say, a bird, mammal, insect, or other being—can no longer exist in the same place. Or, if they are still physically in the space, they cannot exist in the same way.

By existences, I refer to human and other-than-human beings and species, including their interrelations, which could be called their entanglements, meshworks (Ingold 2008), or assemblages (among many more designations used to refer to the interconnection of beings in a particular space). This conceptualization reframes many concepts that are familiar and often uncontested in Western science; for example, through this framing a term like 'biodiversity' would encompass multiple existences and their interactions within a web and circle of life, rather than simply referring to a large number of individual species within a single space. As Gan et al. (2017: 4) argue, 'The problem is not just the loss of individual species but of assemblages, some of which we may not even know about, some of which will not recover'. This new approach is useful as it directs more attention to the actual lives at stake, instead of aggregating all the beings into a biomass or ecology, as often happens with the bio- or eco-whatever concepts. When framed in this way, it also escapes Western modernity's focus on what are labeled as distinct 'species' through Latin taxonomies, which has been critiqued as a dangerous path of speciesism (Singer 1995). Additionally, thinking of beings in such a removed way serves to reduce them to mere objects of study. However, within this broader critique, it should be noted that several studies of biodiversity and ecosystems are useful to foreground the kind of analyses I suggest here, as they offer details on the species and populations in certain areas. Such number-driven analyses can be helpful in the crucial task of gaining more understanding about what is at stake in local transformations. This view also helps to complement the knowledge of Indigenous peoples, who often do not use modern terms to explain what is happening to them and their lived worlds. Instead, they use very different language. I will follow with an example below that illustrates this point, but before this, a few suggestions can be made on how different types of 'frontiers' should be conceptualized, and why.

In this article, a 'frontier of existence' is defined as a site of transforming existing ontologies, that is, a site where the rights and practices of existence are remade as beings (what Western science would call species) change their (inter)relations because of resource extraction. For example, deforestation rates are a proxy for the actual number and scope of lives and possibilities of existence being taken away. Deforestation is closely linked with the expansion of resource frontiers in many parts of the world (Kröger and Nygren 2020), and thus, there is a need to contribute to the frontier literature in terms that highlight the existential impacts of these frontiers.

When I use the term 'resource frontier', I refer to an area in which nature is being framed as a source of 'natural resources' that can be utilized for anthropocentric extraction and processes of accumulation. This constructivist approach to resources follows prior frontier-theorizing, e.g., by Tsing (2015). An area is

not a static space, it is also always a process; by this I mean that life flows through the soil microbes, in the water, and the air—through all kinds of other living beings and processes. These processes and by extension the place in question is transformed by those who see it as a resource frontier, which can be used as a source of raw material extraction. A key benefit of using the concept of the frontier is that it allows for both capturing this processual character of the transformation as an ongoing process and situating the process in relation to particular places and paces. I use the term 'commodity frontier' to refer to value-creation processes and areas whereby commodities are produced for market consumption within global capitalist economies. When these two processes coincide in a particular place, a process called a commoditizing resource frontier changes the landscapes and lives in that place (see Kröger and Nygren 2020). Resource frontiers may not always directly create commodities, but the processes related to them can still result in barrenness and destroyed landscapes through the speculative, violent, and often illegal process of turning state, public, protected, or others' lands into sources of 'natural resources'. The key *modus operandi* is the act of utilizing framing and violence to privatize and enclose land for the purpose of selling it to commodity producers. In the Brazilian Amazon, these actors are often soybean producers or ranchers who buy land from the initial speculators, who have illegally created the land deeds. A commodity frontier may expand even within a standing forest, as was the case with the 19th century rubber boom in the Amazon, whereby natural rubber was extracted mainly through a process of human labor exploitation, instead of a frontier of major existential redistribution, such as a deforesting resource frontier.[4] This article suggests that as powerholders in those areas begin to regard and utilize the area as a 'resource frontiers', the area often undergoes major and dramatic, sometimes even irreversible, environmental changes. Such changes are visible in physical landscapes (traceable, for example, via satellite imagery) but also, most importantly, these changes reconstitute and rearrange what exists and what can exist on the different sides of the frontier of large-scale resource extraction.

Places where the frontier has already changed existences are often framed as 'post-frontier' contexts in the literature, as they are typically, but not exclusively, sites of established resource extraction, with outward commodities flows (e.g., beef, soybeans). These sites can also sometimes contain a mosaic of different types of places, such as some remnants of forests still existing within these spaces (see Kröger and Nygren 2020). This type of mosaic exists in the expansion of the deforesting frontier in the Amazon, where small islands of forest remain and are used by those extracting resources as an example of how their activities are not completely destructive or are even excusable. The analysis herein helps to develop an understanding of the effect of the continued presence of a frontier of existence and its processes, which are tied to these places, and how these processes retain these spaces as sites of extraction. A key dimension here is how the landholders frame themselves as 'soybean producers'. With this framing they place the emphasis on themselves as the key 'producers' of the region, not on the fact that this 'production' is very limited in character and premised on massive and routinized killings and destructions, such as the constant and recurring spread of pesticides on tens of millions of hectares of plantations, an act wherein countless insects and other existences are killed by the orders given by

landholders who view the insects as 'pests'. I will discuss this process after introducing four key questions in the study of frontiers and existences.

FOUR KEY QUESTIONS ON RESOURCE FRONTIERS AND EXISTENCES

As a sign of the current conceptual and programmatic approach in political economy focusing on land relations, Bernstein (2010: 22) has proposed four key questions. Many important political economic analyses have been made through these key questions and, in my view, should continue to be made in the future. Bernstein's questions are: Who owns what?; Who does what?; Who gets what?; and What do they do with it? However, these questions do not explicitly explore the existential dimensions of political economic moves. Thus, to complement and go beyond Bernstein's questions, I propose the following four key questions when assessing the existential scope of differing scales of environmental change. These questions can be used to reflect on productive processes and their respective impact on existences, for example, in critical agrarian studies, studies on agrarian political economies, or other socioenvironmental studies. The development and use of these four key questions in different contexts seeks to complement the existing works that augment the sphere of existences that are considered, such as in the *Feral Atlas* project edited by Anna Tsing, Jennifer Deger, Alder Saxena, and Feifei Zhou (2021).

The four key questions are as follows:

1) Who or what exists?
2) How they can exist (what is the quality of existence)?
3) During what time and/or how long do they exist?
4) Who are the key entities deciding and contesting the above existences?

These questions can aid researchers when they want to go beyond the contemporary anthropocentric approaches, which could make a much more explicit mention of existences. Often in these approaches, when existence is acknowledged, it usually refers only to human existence (e.g., Rasmussen and Lund 2018). To date, political economy and ecology often focus on the relations of labor, capital, and other sociocultural dimensions and factors. There is an especially strong focus on the relations of power and control to the process of spatial territorialization (such as oil palm plantation expansion by smallholders, corporations, and others), which is perceived to be the core of the creation that occurs on commodity frontiers (Rasmussen and Lund 2018). There are, however, tangible changes in terms of the existences that resource frontiers redistribute, the most important process being the killing of innumerable beings and species while frontiers expand. The analysis of these changes can complement the current focus in the study of modern multiculturalism and humans, for example, as done in Mbembé's (2019) study on necropolitics. The focus needs to transcend anthropocentrism and to be on the whole spectrum of life possessed by living organisms. Multisite ethnography and process-tracing can be used as methods to uncover these dynamics, following the onto-epistemological takes and methodological examples provided in Tsing (2015) and Gan et al. (2017). Amerindian knowledges have also been seen as especially useful in this onto-epistemological task (see Haraway 2004).

The categories of what constitutes an Indigenous group, or an extractivist actor, like a corporation, are products of social construction

and encounters, as Golub (2014) has shown through the exploration of a mining conflict. Similarly, what is counted as belonging, or not, to an Amerindian community varies, but a shared distinction of these Amerindian communites 'views from Western communities' ideas is a far lesser anthropocentrism and inclusion of other-than-humans (Gudynas 2015). More broadly, as Moore (2015) highlights, the conception of what is and is not considered part of 'nature' or 'human society' has drastically changed and continues to do so. This is highlighted by the fact that even in the 19th century, enslaved non-white people and most women were considered to be more like nature, which can be appropriated, than part of 'society' (Moore 2015). Therefore, instead of trying to reify or codify existences, the key focus with the above four questions should be on understanding the major, broad changes in terms of the assemblages and relations of the place in question, both before and after the changes caused by the frontier-making processes.

Analysis of the four questions can take into consideration global dimensions, even when this analysis is being carried out at the local level. Such a multi-sited approach helps when considering the crucial issue of scalability, which homogenizes global production patterns. Tsing (2018) explores these dynamics, explaining how logistical maneuvers extract value and lives, and worsen the quality of life. This contention offers an excellent jumping-off point for delving deeper into the different aspects of the four key questions. In addition to the focus on the main destructive processes, such as soybean plantation expansion, I also recommend looking at possible resistance and pockets of other existences in the region under investigation (Kröger 2020a). Tsing (2018) argues that there is always some life that remains, as well as new possibilities for life in these unscalable pockets or in the ruins of the areas where resource frontiers have passed. Yet, the cycle of life and death may have been drastically altered, as highlighted by Rose (2011). I will next consider the four key questions based on my 2019 field research in northern Mato Grosso.

QUESTION 1: WHO OR WHAT EXISTS?

I will use two examples from my fieldwork to illustrate how being an Indigenous person or a colonist, both living through the frontier expansion process, can deeply influence one's perception of who or what exists in that area, and what changes in the existences one notes and emphasizes. The first example is from an interview I conducted in November 2019 with a middle-aged Indigenous man, Nikré Panará, about the impact and experience of the colonization on their lives in northern Mato Grosso since the 1970s, when Brazil's dictatorship ordered settlers from Southern Brazil to colonize and deforest the region. Nikré's words offer insight into a response to the question of what and who can exist, and how this can be changed through frontier expansion:[5]

> When the highway was built, no one knew what roads or tractors were (…) [they] brought many problems to the Panará people. When the highway came, people started to die. I do not know if they [the colonizers] spread something, maybe poison, and many people died! (…) so this brought many problems for the community and very few survived (…)

The introduction of the highway and settlers from the south caused a precipitous decline in the Panará peoples, from approximately 6,000–7,000 persons, according to Nikré, to just 70–75 persons.[6] This literal genocide is indicative of the ongoing processes at frontiers of existences and the role that colonizers can play in dictating who and what can live in an area. A focus on the first key question helps to identify these changes. Nikré also reflected on the impact of the colonization on other-than-human beings:

> This region had tall forest, a place where bows were of use, and today this is not here, so we perceive that today grass substitutes for forest and this leaves a person very sad. (…) Today it is difficult. The population increased, and we have to hunt very far and fish also [very far] because the river today is drying each time more because of deforestation.

Another example of a frontier of existence is found in the soybean and corn plantations in the northern Mato Grosso region. In these spaces, monocultural industrial crops have been planted in the ground that previously hosted a forest full of intricate webs of existence. The annihilations that have occurred and continue to occur within the plantations are striking. However, when interviewing Marcos Ioris in Nova Mutum, where he owned 1,200 hectares and rented over 5,000 hectares of land that he had deforested for soybean and corn plantations, I discovered that he had a very different way of conceptualizing who or what exists in the area.

First, I asked him what was here on this land before the soybean plantations. His answer was revealing of his thinking around existences and the order of existential importance regarding what is given the most value, space, and attention.

> Before this, there was corn. We took the corn out in June and the straw stayed there. When it starts raining, we plant soybeans, so here the model is taking the soybean out, planting corn, taking the corn out, planting the soybean.

He did continue, but only after the soybeans and corn were given the primary importance:

> Before the implementation of the crop, there was *Cerrado*. We explored it within the law. If you look further there, there is a forest, our legal reserve. We have 20 percent of the area as a reserve according to the legislation in force; at the time, we could explore 80 percent. We planted rice in the first year, then soybean and corn.

With only the briefest nod to the biome that previously existed here with all its existences and relations, Marcos continued to focus on the plantation and the monoculture, which were planted in the space that once was forest. This region is an Amazon-Cerrado transition forest, previously the home of the Panará and other Indigenous groups, not 'Cerrado' devoid of life, or with an inferior nature. It should also be explicitly noted that Marcos and other medium-size (a few thousand hectares) or large-scale (tens of thousands of hectares) landholders are not engaging with agroecological practices or other sustainable farming systems. Their practices are the epitome of industrialized agricultural practice, with almost all the soy, corn, and cotton in the region genetically modified to serve the implementation of agroextractivist processes (see McKay et al. 2021). This monocultural agriculture is designed in a way that very few beings—aside from the cloned plants—are permitted to exist in the space of the fields. Those that do manage to

make a life between the heavily poisoned rows are viewed as pests and are also eradicated whenever possible.

These practices take place within an extractivist ontology and logic, defining what can exist in the area, in what order of value, and in which relations. It should be noted that the species that are considered bothersome or intolerable pests within a monoculture landscape are not pests in a setting with high biodiversity. This is because the presence of so many other plants and animals allows these purported pests to live appropriately in their niche, and the overarching diversity does not allow the effects of a single species to be so amplified (Altieri 2018). These complementary existences have been sidelined since the early modern era, when certain human groups started to be favored alongside some companion crops, through an intensifying logic of focusing on monocrops (Hetherington 2020). The insights into Marcos' relations to the existences on his land and what existed there before reveal how steeped in the monocultural logic he is. Monoculturization causes transformations and redistribution of almost all the existences in its vicinity, including the forms of life that are its agents. This monoculture logic replicates itself, based on expansion relying on the original point of extraction, and its logic of redistributing existences. The same style of refashioning existences takes place throughout the entire commodity chain, from monoculture plants to transport, animals, laborers, and consumers. This monocultural chain of causation occupies these spaces, instead of the rich mosaic of multiple types of existences and ways of existing once found in the forest.

To summarize, the commodity frontier expansion in Mato Grosso has drastically altered the spectrum of life and transformed very large areas of the Cerrado-Amazon forests into monoculture plantations. The dynamics along this frontier of existence have drastically reduced the possibilities of what existences are able and allowed to be in this space.

QUESTION 2: HOW THEY CAN EXIST (WHAT IS THE QUALITY OF EXISTENCE)?

I will use the existences of the chickens living in the industrial feedlot facilities located close to the plantations of Marcos and others in Mato Grosso to illustrate how the quality of life of other-than-human animals is transformed when plantations and feedlot facilities are expanded at the cost of forests. Industrial feedlots share these qualities around the world, and this discussion and example could be expanded elsewhere. The kinds of existences described here were abundant and fast expanding in the northern Mato Grosso plantation areas, as the feed production is so near and massive in scale. This results in very fast and expanding cycles of these specific existences in this region. The physicality of the chickens in these facilities is far removed from their non-industrialized counterparts, as, for example, Weis (2013) has shown. They have been bred and genetically modified to grow more quickly, so they can be slaughtered faster, with more meat on their bones. In addition to the way their bodies have been skewed, their very existence is so regulated and unnatural that there are little to no other possibilities left for these chickens to behave or live outside of these industrialized settings (Weis 2013). This violence enacted on these chickens has turned the whole of their existence into a monotonous life. In this way, the routinized and rhythmic, monotonous production of animals for meat can also be seen as a frontier of existence, a process

which constantly transforms and is visible not only in the broader landscape (i.e., livestock factories), but which takes the body of animals as its site of redistributing existence (also in terms of quality).

Aside from the effects on the other-than-humans (i.e., the chickens), the humans who live and work in the area are also impacted by the industrialized agribusiness, as many facets of it contribute to a worsening of the quality of life in the longer term.[7] Researchers have found that the work of humans in the industrial chicken facilities is monotonous (Winders and Ransom 2019). Besides this, as automation is increasing, the agribusiness workers are in danger of losing their jobs. Aside from the workers, I noted that the extractivist capitalists living in the area seemed to be extremely busy, mostly thinking about work and increasing production, as they are constantly pressured by the necessity to expand and take bigger loans. Landholders told me they are stressed by debts and an ever-increasing need to produce more, which drives them to take bigger loans to buy more and increasingly expensive fertilizers, patented seeds, and machinery. Droughts and other climatic disruptions also worried the producers, they told me as these events have increased and cause them to need to use evermore larger doses and more toxic pesticides to be able to produce in the region. These tendencies suggest that even for the wealthy the way of being in the region is going to turn more tumultuous, as the currently praised, relative wealth of the region turns into greater distress and diseases as the climate disruptions and use of pesticides increase.

QUESTION 3: DURING WHAT TIME AND/OR HOW LONG DO THEY EXIST?

The third key question opens up several important ontological questions on temporality and how one should study the temporal transformations that accompany major landscape changes. This question can be used to complement and expand the prior contributions by Marxist approaches to frontiers, which emphasize how capitalism transforms time (Thompson 1967). The length of time a being can exist is redefined when frontiers expand. For example, production animals live very short lives in comparison to what would be natural for their species, or in comparison to the length of time wild animals would have lived if the livestock facilities and feed plantations had not taken away their space. Beyond the lives of the animals, the very rhythm of life is disrupted via the frontier expansion. The modern conception of time is largely linear; however, there are many cosmologies, ontologies (Blaser 2013), and states of being that do not ascribe to a linear concept of time. As Gan et al. (2017: 10) emphasize, the 'metronomic synchrony [of modernity] is not the only time that matters'. Bearing this in mind, 'frontiers of existence' impact how long a being can exist, and they rearrange the conception of time among those people who are active within them. This extends to the workers and bosses, who are tasked with seeing that the process of production continues in its desired rhythm. Anthropological studies of time have built on this tradition, explaining in detail how capitalist expansions transform time through mechanisms such as debt (Bear 2017). Debt proved to be an essential mechanism for expanding soybean plantations in northern Mato Grosso, as the producers need to take out extensive loans to buy the ever-more expensive machineries, and then

produce more and faster to be able to make the payments, as Ioris explained to me. Bear (2017) frames the creation of such debt relations as capitalist techniques of time, to which different actors react differently, producing contextually varying timescapes. The variety of timescapes goes beyond a division between linear and non-linear, as such a dichotomy rarely actually exists according to Gell (1992). This is visible in how many Indigenous communities in the Amazon still mostly remain in their territories, as they are not only socio-territorial communities and movements tied to particular places, but also socio-temporal communities, which inhabit these places all the time. In comparison, the soybean plantation 'producers' live in towns, often very far from the fields, even in distant cities in Southern Brazil, thus having radically distinct relations with time. Their actions nonetheless eradicate the existence of socio-temporal communities' space and time.

Agroextractivist plantations result in a fast lifecycle, as any given cloned crop is only intended to live for a few years (if even that). These new accelerated existences are forced on land that used to host a species-rich forest containing many varying lifespans. Some plants within the forest would live for a very long time, while others were more ephemeral, nevertheless experiencing a natural rhythm in relation to their respective lifecycles.

When one is on a monocultural plantation, time must flow to the rhythm that suits the order and needs of the commodity production. In this setting, there are many ways that time is twisted into a machine-like rhythm, which is compelled to run at a fast pace to meet the production needs. The production constantly demands a quickening of the process of monotonous time. There are many ways this is accomplished, including increasing the number of truckloads transported within a given time or increasing the plantings and harvests per year. On the extreme end, the beings produced are genetically engineered to grow faster so they can be slaughtered sooner, a new altered being can take their place, and the cycle can continue. The humans working within the frontier are compelled to work faster and reach ever-increasing targets for 'production', such as the extraction in the form of slaughters done per shift. Concerns about the disruption of time and existences were central in the interviews I had with the locals in these regions, where the key things mentioned and emphasized were 'production' and produced commodities, and that the rhythm of production was timing lives. For example, the scheduling and recurring spread of agrotoxics on the fields to kill particular beings were key processes timing existences, which were also affected by the broader political economy and development of technology. In field visits I was introduced to novel poisoning machineries, such as ever-faster and ever-more expensive tractors made specially for poisoning. Producers also mentioned that drones would be their next step in investment. This will have major impacts on the assemblage of beings and their situated being in the places, as the drones can be operated from a distance, there being no more need to physically go to the fields, and the agrotoxic poisonousness can be increased evermore.

The observations in northern Mato Grosso revealed how the plants, farm animals, and people who exist in plantation monocultures are forced into a radically transformed rhythm of time, that is, temporal existence. This extends to the wild animals and insects who also experience shifts in their existence, as their lives are cut short due to the presence of monoculture, at the expense of their natural habitats. These

changes to time are radical and as disruptive as the decrease in the spectrum and quality of life.

From a broader perspective, existential change within the context of a commoditizing resource frontier differs dramatically from non-frontier contexts, as changes in land control (e.g., via land grabs/deals) are *de facto* long-lasting due to the very rapid appreciation of asset values. The recent establishment of such timescapes that support capital accumulation around the globe has led to major existential impacts on the ground. For example, simultaneously with the global land-grab boom in 2008–2013, there was a sharp decline in the *de jure* recognition of community land rights in tropical forest areas, despite commitments and pledges from powerholders to safeguard these rights. This has led to a five-fold decrease in the area of forestland secured for community ownership in comparison to the 2002–2008 period (RRI 2014).

The analysis above illustrates how one can make use of the third key question to merge existential analysis with political economy.

QUESTION 4: WHO ARE THE KEY ENTITIES DECIDING AND CONTESTING WHAT AND WHO CAN EXIST?

The fourth question prompts a detailed assessment of the politics at play around the other three key questions. When answering this fourth question, one should consider the role of social actors (i.e., a company, the state/government organization, social movements, and other human groups) and the key individuals within these groups. It is also useful to consider the roles of other-than-human actors.

The most prominent key actors in Nova Mutum who decide what can exist and how it can exist are those who act through and within the capitalist logic that has come to dominate the region. By this, I mean ventures that are dominated by thinking that revolves around the calculation of profits and costs at the expense of all other motivations and existences. In Nova Mutum, there are different valuations given to what was there before and what exists there now, which leads to the process of deforesting the Cerrado-Amazon. As illustrated by the examples above, it is clear that the soybean producers had very different viewpoints on the area than the Indigenous groups. However, they wielded much more power and influence when it came to deciding what has value, what can live, and what does live in the region. Even the workers in Nova Mutum had very little power, as they had no substantial organization outside of the structure provided by a syndicate of the large producers. They did not even have a rural workers' trade union to help train them or educate them about their rights and responsibilities as beings within the space.

There are also important other-than-human actors, such as microbes, insects, and wild animals, which the 'producers' see as agents that are hard to control. The farmers told me about the power of some of the other-than-human actors, namely, those that they deemed pests. These beings would occupy the fields if the farmers did not continually get rid of them. Some environmental officers also seemed to have some power, as they were referenced by Marcos as having charged operations at some farms with environmental crimes. Yet, these cases were few and far between, as there was mostly an ambience of impunity for deforesters, due to the policies of the Bolsonaro government that allow illegal logging and ever-greater use of pesticides. Most importantly, the soybean farmers and other agribusiness people have Brazil's strongest political lobby and are extremely well connected

with politicians and bureaucrats in the Brazilian capital and other centers of power. I found this out while doing ethnographic research within the Brazilian Congress, attending sessions, talking to politicians, and hanging out in the corridors and offices in December 2018 and October 2019.

In summary, resource frontier expansions have major consequences in terms of radically limiting the scope of existences. Politics in the post-frontier spaces where the frontier of existence has already done its major damage—and is constantly making the space less like what it was before the alterations—seem to be dominated by a few key players. In this case, it is the so-called soybean producers who have amassed power. They are making critical decisions about existential transformations at frontier sites, and these need to be better incorporated in future studies of frontiers.

CONCLUSIONS

This article has provided a complementary theory and four key questions for addressing and noting in more detail the many dimensions and the scale of existential transformations that occur at resource frontiers. One example is when monoculture plantations are expanded over high-biodiversity Amazon forests inhabited by Indigenous groups. Major landscape-altering transformations have been taking place at an accelerating pace around the world, starting with sugar and other plantation frontiers in the 15th century (Moore 2015). I argued that these frontiers have been expanded extraordinarily in the past decades, in relation to scale and impact on existences. Thus, much more attention needs to be placed on these existential dimensions, in addition to and to complement the more traditional focus on cultural and political economic transformations.

In this article I have argued that frontier expansions are transformations that are fundamentally redistributing where, how, and what beings can exist. I gave attention to the need to study not only how human existences are transformed, but also how other-than-human existences are changed, including a focus on the temporalities of other-than-human processes. These redistributions of existences, with their concomitant annihilations and creations, often accompany the expansion of resource frontiers. Much more study is required on this topic, with this article serving the purpose of offering a complementary theoretical framework to analyze resource and commodity frontiers as frontiers of existence. A fundamental shift in vocabulary is needed to bring these existences to the forefront. This issue is even more pressing due to the expansion of monocultures (such as soybeans or industrial forestry plantations) through a process of destroying and appropriating landscapes where multiple species can and do exist (such as primary or secondary forests). The concept of 'frontiers of existence' helps in understanding the major differences in what and who can or cannot exist. This article has used studies of the Brazilian Amazon and Cerrado to illustrate how the lens of 'frontiers of existence' is helpful to analyze how and why these existences are distributed.

Future research should also pay attention to how frontiers, such as those explored in this special issue, influence state and commodity creation processes through their existentially redistributive dimensions. This would help to reveal the bases of modern nation-state creation in terms related to the costs to existing lives and future possibilities of living. The way powerholders are not taking into account existences and their losses has been a key motivation for writing this article and my suggestion that scholarly and policy discussions

could benefit from the introduction of the concept of frontiers of existence.

Political economic analysis should be merged with the key questions on who can exist, how, in what time, and through which politics. The suffering caused to beings by those expanding the frontiers is not created without also causing damage in the classic political-economic sense. As a political-economic consequence of recent frontier expansions, Marques (2007) argues that the Amazon is being fixed as a mineral-energetic colony for the rest of the country and multinational production capital. Furthermore, Brazil's economy is becoming ever more reliant on raw material exports, with damaging impacts on social welfare and equity (Young 2017). Yet, consolidating nation-states and governments—worried about their geopolitical status or pressured within the international system to allow for imperial or multinational capital expansions over their territories—have been key actors in expanding resource frontiers with major existential impacts (Kröger 2020c). These impacts include the extinction of Indigenous populations and deforestation, which are still taking place. However, this analysis of the state-existences interface should also keep in mind that frontiers are not only spaces that destroy, but also create possibilities for something new to arise and thrive. It is also important to remember that none of these processes are eternal or manage to get a complete grip and control, even when they are based on thousands or millions of hectares of monocultures that displace forests.

NOTES

1 Herein I refer to plantations and monocultures interchangeably, as they are so closely related and aligned in Brazil's soybean, corn, sugarcane, and eucalyptus plantations. However, it should be noted that they vary somewhat in relation to their labour organization and racial-ethnic relations, depending on the context and the crop. These factors are all central components in expanding what has been called the Plantationocene (Wolford 2021).

2 I am not referring to or building on French or other Western existential philosophical traditions, as I refer to the existences of beings in a similar fashion to the understanding of what exists in South American Indigenous cosmologies.

3 De la Cadena and Blaser (2018: 6) explain that the concept is capitalized 'to call attention to the specificity of the imaginary that we propose here, namely, the consideration of the pluriverse as a possibility'. They explain that Political Ontology 'simultaneously stands for reworking an imaginary of politics (the pluriverse), for a field of study and intervention (the power-charged terrain of entangled worldings and their dynamics), and for a modality of analysis and critique that is permanently concerned with its own effects as a worlding practice'.

4 See Kröger and Nygren (2020) for further discussion of this conceptual division, which is drawn from frontier research and experiences across different Latin American contexts.

5 Please note that we spoke in Portuguese, which was not his first language, and I then translated the interview into English.

6 Povos Indígenas no Brazil (2021 [2004]). The account of the number of Panará vary, with Schmink and Wood (1984) suggesting there were only about 250–350 Panará when the BR163 Highway was built across their territories.

7 Pędłowski (2021).

REFERENCES

Alston, Lee J., Gary D. Libecaps and Bernardo Mueller 2000. Land Reform Policies, the Sources of Violent Conflict and the Implications for Deforestation in the Brazilian Amazon. *Journal of Environment and Resource Management* 39 (2): 162–188. https://doi.org/10.1006/jeem.1999.1103.

Altieri, Miguel A. 2018. *Agroecology: The Science of Sustainable Agriculture*. Boca Raton: CRC Press. https://doi.org/10.1201/9780429495465-19.

Barbier, Edward 2012. Scarcity, Frontiers and Development. *The Geographical Journal* 178(2): 110–22. https://doi.org/10.1111/j.1475-4959.2012.00462.x.

Bear, Laura 2017. Anthropological FutureS: For a Critical Political Economy of Capitalist Time. ASA's Raymond Firth Lecture, 2016. *Social Anthropology* 25 (2): 142–158. https://doi.org/10.1111/1469-8676.12412.

Bernstein, Henry 2010. *Class Dynamics of Agrarian Change.* Halifax: Fernwood Publishing.

Blaser, Mario 2013. Ontological Conflicts and the Stories of Peoples in Spite of Europe: Toward a Conversation on Political Ontology. *Current Anthropology* 54 (5): 547–568. https://doi.org/10.1086/672270.

Browder, John, Marcos A. Pedlowski, Robert Walker, Randolph H. Wynne, Percy M. Summers, Ana Abad, Nancy Becerra-Cordoba and Joao Mil-Homens 2008. Revisiting Theories of Frontier Expansion in the Brazilian Amazon: A Survey of the Colonist Farming Population in Rondônia's Post-Frontier, 1992–2002. *World Development* 36(8): 1469–1492. https://doi.org/10.1016/j.worlddev.2007.08.008.

Bunker, Stephen 1985. *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State.* Chicago: The University of Chicago Press.

Campbell, Jeremy M. 2015. *Conjuring Property: Speculation and Environmental Futures in the Brazilian Amazon*. Seattle: University of Washington Press.

Cleary, David 1993. After the Frontier: Problems with Political Economy in the Modern Brazilian Amazon. *Journal of Latin American Studies* 25(2): 331–349. https://doi.org/10.1017/S0022216X00004685.

de la Cadena, Marisol 2010. Indigenous Cosmopolitics in the Andes: Conceptual Reflections Beyond 'Politics.' *Cultural Anthropology* 25(2): 334–370. https://doi.org/10.1111/j.1548-1360.2010.01061.x.

de la Cadena, Marisol 2014. The Politics of Modern Politics Meets Ethnographies of Excess through Ontological Openings: Theorizing the Contemporary. *Fieldsights*, 17 January. https://culanth.org/fieldsights/the-politics-of-modern-politics-meets-ethnographies-of-excess-through-ontological-openings. <Accessed 4 November 2021>

de la Cadena, Marisol 2015. *Earth Beings: Ecologies of Practice Across Andean Worlds.* Durham: Duke University Press. https://doi.org/10.2307/j.ctv11smtkx.

de la Cadena, Marisol and Mario Blaser (eds.) 2018. *A World of Many Worlds*. Durham, NC: Duke University Press. https://doi.org/10.1515/9781478004318.

Escobar, Arturo 2020. *Pluriversal Politics: The Real and the Possible*. Durham, NC: Duke University Press. https://doi.org/10.1515/9781478012108.

Foweraker, Joe 1981. *The Struggle for Land: A Political Economy of the Pioneer Frontier in Brazil from 1930 to the Present Day.* Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511572258.

Gan, Elaine, Nils Bubandt, Anna Löwenhaupt Tsing and Heather Anne Swanson 2017. Introduction: Haunted Landscapes of the Anthropocene. In Anna Lowenhaupt Tsing, Heather Anne Swanson, Elaine Gan, and Nils Bubandt (eds). *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene.* Minneapolis: University of Minnesota Press.

Gell, Alfred 1992. *The Anthropology of Time: Cultural Constructions of Temporal Maps and Images*. New York: Berg.

Golub, Alex 2014. *Leviathans at the Gold Mine: Creating Indigenous and Corporate Actors in Papua New Guinea.* Durham, NC: Duke University Press. https://doi.org/10.1515/9780822377399.

Gudynas, Eduardo 2015. *Extractivismos: Ecología, economía y política de un modo de entender el desarrollo y la naturaleza.* Cochabamba: CEDIB.

Haraway, Donna 2004. *The Haraway Reader*. New York: Routledge.

Hay, Colin 2006. Political Ontology. In Robert E. Goodin and Charles Tilly (eds). *The Oxford Handbook of Contextual Political Analysis (Online)* Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199270439.003.0004.

Hecht, Susanna and Alexander Cockburn 1989. *Fate of the Forest*. London: Verso.

Hetherington, Kregg 2020. Agribiopolitics: The Health of Plants and Humans in the Age of Monocrops. *Environment and Planning D: Society and Space* 38 (4): 682–698. https://doi.org/10.1177/0263775820912757.

Hoefle, Scott William 2013. Beyond Carbon Colonialism: Frontier Peasant Livelihoods, Spatial Mobility and Deforestation in the Brazilian Amazon. *Critique of Anthropology* 33 (2): 193–213. https://doi.org/10.1177/0308275X13478224.

Ingold, Tim 2008. Bindings Against Boundaries: Entanglements of Life in an Open World. *Environment and Planning A: Economy and Space* 40 (8):1796–1810. https://doi.org/10.1068/a40156.

Jepson, Wendy 2006. Producing a Modern Agricultural Frontier: Firms and Cooperatives in Eastern Matto Grosso, Brazil. *Economic Geography* 82 (3): 289–316. https://doi.org/10.1111/j.1944-8287.2006.tb00312.x.

Kröger, Markus and Anja Nygren 2020. Shifting Frontier Dynamics in Latin America. *Journal of Agrarian Change*. https://doi.org/10.1111/joac.12354.

Kröger, Markus 2020a. Deforestation, Cattle Capitalism and Neodevelopmentalism in the Chico Mendes Extractive Reserve, Brazil. *The Journal of Peasant Studies* 47 (3): 464–482. https://doi.org/10.1080/03066150.2019.1604510.

Kröger, Markus 2020b. Politics of Extraction: Theories and New Concepts for Critical Analysis. *Oxford Bibliographies Online in International Relations*. https://doi.org/10.1093/obo/9780199743292-0292.

Kröger, Markus 2020c. Natural Resources, Energy Politics, and Environmental Consequences. *Oxford Bibliographies Online* in International Relations. https://doi.org/10.1093/obo/9780199743292-0291.

Locke, Piers and Ursula Muenster 2015. Multispecies Ethnography. In *Oxford Bibliographies in Anthropology*. New York: Oxford University Press. https://doi.org/10.1093/obo/9780199766567-0130.

Marques, Gilberto de Souza 2007. *Estado e desenvolvimento na Amazônia: a inclusão amazônica na reprodução capitalista brasileira*. Doctoral Dissertation. Rio de Janeiro: UFRRJ/CPDA. https://institucional.ufrrj.br/portalcpda/files/2018/08/2007.tese_.gilberto_de_souza_marques.pdf <Accessed 3 November 2021>

Martins, José de Souza. 1984. *A militarização da questão agraria no Brasil.* Petrópolis: Vozes.

Mbembé, Achille 2019. Necropolitics. In Stephen Morton and Stephen Bygrave (eds). *Foucault in an Age of Terror: Essays on Biopolitics and the Defence of Society*. London: Palgrave Macmillan. https://doi.org/10.1057/9780230584334.

McKay, Ben M., Alberto Alonso-Fradejas and Arturo Ezquerro-Cañete (eds) 2021. *Agrarian Extractivism in Latin America*. London: Routledge. https://doi.org/10.4324/9780367822958.

Moore, Jason 2015. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. London: Verso.

Nepstad, Daniel, David McGrath, Ane Alencar, Ana Cristina Barros, Georgia Carvalho, Márcio Santilli and Maria del Carmen Vera Diaz 2002. Frontier Governance in Amazonia. *Science* 295 (5555): 629–631. https://doi.org/10.1126/science.1067053.

Nolte, Christoph, Yann le Polain de Waroux, Jacob Munger, Tiago N. P. Reis, and Eric F. Lambin 2017. Conditions Influencing the Adoption of Effective Anti-Deforestation Policies in South America's Commodity Frontiers. *Global Environmental Change* 43: 1–14. https://doi.org/10.1016/j.gloenvcha.2017.01.001.

Nugent, Stephen 2006. Frontiers and Enclaves: Metaphor and Concept in Brazilian Amazonia. *Cambridge Anthropology* 26 (2): 69–78. https://www.jstor.org/stable/23820841. <Accessed 4 November 2021>

Pędłowski, Marcos (2021). Agrotóxicos perigosos têm uma nova onda de novos registros no Brasil. *O Blog do Pedlowski*, 28 October. https://blogdopedlowski.com/?s=agrotoxico <Accessed 4 November 2021>

Povos Indígenas no Brazil 2021 [2004]. *Panará*. ttps://pib.socioambiental.org/pt/Povo:Panará. <Accessed 4 November 2021>

Raffles, Hugh 1999. 'Local theory': Nature and the Making of an Amazonian Place. *Cultural Anthropology* 14(3): 323–360. https://doi.org/10.1525/can.1999.14.3.323.

Rasmussen, Mattias Borg and Christian Lund 2018. Reconfiguring Frontier Spaces: The Territorialization of Resource Control. *World Development* 101: 388–399. https://doi.org/10.1016/j.worlddev.2017.01.018.

Rodríguez Mega, Emiliano 2020. 'Apocalyptic' Fires are Ravaging the World's Largest Tropical Wetland. *Nature* 586: 20–21. https://doi.org/10.1038/d41586-020-02716-4.

Rose, Deborah Bird 2004 *Reports from a Wild Country: Ethics for Decolonisation*. Sydney: University of New South Wales Press.

Rose, Deborah Bird 2011 *Wild Dog Dreaming: Love and Extinction*, Charlottesville: University of Virginia Press.

Rose, Deborah Bird (n.d.) Double Death. *The Multispecies Salon*. https://www.multispecies-salon.org/double-death/. <Accessed 3 November 2021>

RRI (Rights and Resources Initiative) 2014. *Lots of Words, Little Action: Will the Private Sector Tip the Scales For Community Land Rights?* Washington D.C.: Rights and Resources Initiative.

Schmink, Marianne and Charles H. Wood 1984. *Frontier expansion in Amazonia.* Miami: University of Florida Press.

Schmink, Marianne and Charles H. Wood 1992. *Contested Frontiers in Amazonia.* New York: Columbia University Press.

Singer, Peter 1995. *Animal Liberation.* New York: Random House.

Thompson, Edward P. 1967. Time, Work-Discipline, and Industrial Capitalism. *Past & Present* 38: 56–97. https://doi.org/10.1002/9781119395485.ch3.

Tsing, Anna Lowenhaupt 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press. https://doi.org/10.1515/9781400873548.

Tsing, Anna Lowenhaupt 2018. On Nonscalability: The Living World Is Not Amenable to Precision-Nested Scales. *Common Knowledge* 18 (3):143–162. https://doi.org/10.1215/0961754X-1630424.

Tsing, Anna Lowenhaupt, Jennifer Deger, Alder Saxena and Feifei Zhou (2021) *Feral Atlas: The More-Than-Human Anthropocene*. https://doi.org/10.21627/2020fa.

Van Dooren, Thom, Deborah Bird Rose and Matthew Chrulew (eds) 2017. *Extinction Studies: Stories of Time, Death, and Generations.* New York: Columbia University Press. https://doi.org/10.7312/van-17880.

Viveiros de Castro, Eduardo 2012. *Cosmological Perspectivism in Amazonia and Elsewhere*. HAU: Masterclass Series 1. https://haubooks.org/cosmological-perspectivism-in-amazonia/. <Accessed 4 November 2021>

Viveiros de Castro, Eduardo and Déborah Danowski 2018. Humans and Terrans in the Gaia War. In Marisol de la Cadena and Mario Blaser (eds). *A World of Many Worlds*. Durham, NC: Duke University Press. https://doi.org/10.1215/9781478004318-007.

Weis, Anthony John 2013. *The Ecological Hoofprint: The Global Burden of Industrial Livestock.* London: Zed Books. https://doi.org/10.5040/9781350223080.

Winders Bill and Elizabeth Ransom 2019. *Global Meat: Social and Environmental Consequences of the Expanding Meat Industry.* Cambridge, MA: The MIT Press. https://doi.org/10.7551/mitpress/11868.001.0001.

Wolford, Wendy 2021. The Plantationocene: A Lusotropical Contribution to the Theory. *Annals of the American Association of Geographers* 111 (6): 1622–1639. https://doi.org/10.1080/24694452.2020.1850231.

Young, Carlos Eduardo Frickmann 2017. *Por um punhado de cobres: mineração e retrocesso na Amazônia*. 28 August. https://qualidadedademocracia.com.br/por-um-punhado-de-cobres-mineração-e-retrocesso-na-amazônia-2288f03b4f19. <Accessed 3 November 2021>

MARKU KRÖGER
ASSOCIATE PROFESSOR
GLOBAL DEVELOPMENT STUDIES
HELSINKI INSTITUTE OF
SUSTAINABILITY SCIENCE
UNIVERSITY OF HELSINKI