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Domestication of Amazonian landscapes

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Introduction

Amazonia is the largest biome in South America and, although often considered an untouched environment in the popular imagination, its landscapes have been modified by Indigenous Peoples since their arrival at least 13,000 years (Shock; Moraes, 2019). Indigenous populations grew until Portuguese and Brazilian colonization in the region (Denevan, 2014), when the decimation of Indigenous Peoples by wars, slavery and diseases resulted in unoccupied landscapes for the first time since the arrival of these peoples (Denevan, 2011). When the first naturalists visited Amazonia at the end of the 18th century and during the 19th century, they found forests and other ecosystems practically without human occupation, which allowed the erroneous interpretation of Amazonia as a pristine biome (Denevan, 2011). From the 1980s onwards, archaeologists (Heckenberger and Neves, 2009) and historical ecologists (Balée; Erickson, 2006) began to question this interpretation because human legacies were identified in the forests. Currently, part of the scientific community considers that Amazonian forests were domesticated, that is, they were transformed by human management practices (Clement et al., 2015), as has occurred in most of the world's biomes, which are anthropized biomes or anthromes (Ellis et al., 2020). With a focus on Brazilian Amazonia, this essay will review recent literature on the domestication of Amazonian landscapes by Indigenous Peoples.

Domestication are processes by which humans modify landscapes or populations of some species (Clement et al., 2021). The root of the word comes from Latin: *domus* (the house and its dependencies). The dependencies include the gardens, swiddens, orchards, agroforests, fallows and forests around the house, which are home to people, plants and animals. Archaeobotanical remains from the oldest dated sites in Amazonia suggest that their first inhabitants began to domesticate forests around camps even before transforming their dump heaps into gardens, orchards or agroforests (Shock; Moraes, 2019), which demonstrates the antiquity of the process of landscape domestication in the biome, and soon after records of plants in the process of domestication appear (Shock; Watling, 2022).

Domestication, both of landscapes and plant populations, is considered fundamental to explaining the success of the human species throughout the Holocene (Graeber; Wengrow, 2021), although the term carries a negative connotation because it is associated with the history of European colonization of the planet, especially with monocultures and, more recently, industrial agriculture (Bogaard et al., 2021; Graeber; Wengrow, 2021), among the root causes of the Anthropocene. This connotation is associated with other terms, such as domination and control (Lien et al., 2018), which are evident in the definitions of the verb "domesticate" in the Aurélio Dictionary: 1. to become domestic; tame; dominate.

In Amazonia, as in other parts of the world, academics are questioning the term domestication to demonstrate that the European connotation belongs to a certain society, not to all societies – especially not to Amazonian societies (Aparicio, 2020; Carneiro da Cunha, 2019; Clement et al., 2021; Mendes dos Santos; Henriques Soares, 2021). Amazonian peoples experience their relationships with non-human beings through the establishment of social relationships, since, according to their ontologies, humans and non-humans share social attributes (Descola, 1992; Viveiros de Castro, 2004). Thus, instead of domination and control, there is negotiation and respect (Aparicio, 2020), care and cultivation (Clement et al., 2021).

In recent decades two new associated concepts have gained ground: niche construction and cultural niche construction (Odling-Smee et al., 2003). "Niche" is a concept that encompasses the physical and biological means that a species needs to survive and reproduce; every species has a niche, and the niches overlap so that the same environment contains niches partially shared by multiple species. All species build parts of their niches, thus facilitating their adaptation to the environment (Odling-Smee et al., 2003). In turn, the concept of cultural niche construction focuses on the human niche that is constructed through cultural practices that transform landscapes and plant populations (Laland; O'Brien, 2010). The relationship of these concepts with domestication are clear. Some Indigenous People construct landscapes with horticulture (swidden-fallow) and forest management, for example people that speak Arawak languages (Heckenberger, 2002). Others concentrate more on practices associated with forest management, for example people that speak Arawa (Shiratori et al., 2021) and Nukak (Politis, 1996) languages.

In this essay, we will show how Amazonian Indigenous Peoples domesticate forests and other ecosystems, some differences among Indigenous Peoples speaking different languages in terms of their ways of life and, therefore, domestication of their landscapes, and the scale and intensity of changes in the Amazonian biome that we can attribute to the domestication of landscapes and plants. With this we will show that good living in Amazonia did not and does not depend exclusively on horticulture or – today – agriculture, and that the biome is domesticated to different degrees and offers lessons to find alternatives to the Anthropocene.

How to domesticate a landscape

To understand how the domestication process occurs, researchers documented and analyzed the choices, actions and strategies carried out in the daily lives of Indigenous Peoples and traditional communities (Levis et al., 2018). Such practices are the basis of the landscape domestication process and result in transformed environments that offer conditions more favorable to human needs, such as, for example, a greater abundance of resources of interest to humans (Flores; Levis, 2021).

In the case of forests, useful trees and palms, most of which produce fruit, are resources of great interest to humans, which means that management practices are mainly aimed at increasing their abundance in the landscape (Levis et al., 2018). This can be done by protecting seedlings or adult trees of useful species, such as Brazil nut (*Bertholletia excelsa*). Another practice that favors useful species is the removal of non-useful species, including lianas and unproductive individuals, as this reduces competition and promotes the development of species of interest. In addition to increasing the abundance of useful species, humans may be responsible for increasing the range of a species through the intentional planting of seedlings and seeds or through the dispersal of these propagules to new regions – which can occur unintentionally along trails, in swiddens and in home gardens. This expanded geographic distribution may also be influenced by dispersing animals that are attracted to aggregations of useful species tended by humans (Levis et al., 2018).

Other practices that influence the abundance of plants of interest to humans and that transform forest landscapes are soil improvement and the use of fire, which create environmental filters that favor certain plants, generally for food (Levis et al., 2018). The combination of these practices in pre-Columbian settlements favored the formation of Amazonian Dark Earths (Terra Preta de Índio (TPI) in Portuguese), soils of anthropogenic origin, common in domesticated forest landscapes (Iriarte et al., 2020; Oliveira et al., 2020). The domestication of populations of species can occur together with the domestication of landscapes (Clement et al., 2021). Generally, individuals protected by humans are previously selected and, when propagated outside the range of their original population, these selected plants become more abundant in the landscape (Levis et al., 2018).

Although Amazonia is mostly made up of forests, part of the territory is covered by savannas, formed by a mosaic of ecosystems that include natural grasslands, savannahs and forest patches (Ribeiro; Walter, 2008). In these open and fire-dependent ecosystems, grasslands and savannas are more common (Pivello et al., 2021) and are used by Indigenous Peoples for hunting and collecting non-forest products (Ferreira et al., 2022). These environments are domesticated mainly to maintain their general characteristics, such as the low concentration of trees and the continuous herbaceous layer (Ferreira et al.,

2022; Ribeiro; Walter, 2008). Fire is a central tool in management practices in savannas, used to clear grasslands, stimulate the renewal of grasses appreciated by game animals, and to herd animals to the slaughter site (Ferreira et al., 2022; Mistry et al., 2005). Prescribed fire is also used to reduce dry organic matter, the accumulation of which is one of the main causes of wildfires that cause the degradation of adjacent forests (Ferreira et al., 2022).

Another example of the domestication of Amazonian savannas in humid areas are the topographic changes made by pre-Columbian people in the Beni region of Bolivia (Erickson, 2000) and along the coasts of the Guiana shield (Rostain, 2010). The construction of elevated mounds shows how the domestication of these landscapes was carried out to circumvent the environmental pressures caused by periodic flooding, thus allowing humans to grow food on dry land without the need to use fire (Iriarte et al., 2012). These landscapes were also enriched with tree species, allowing humans to increase the abundance of food resources around their settlements (Carson et al., 2014; Ferreira et al., 2022). In the mound areas of the Amazonian savannas of Bolivia, Indigenous Peoples built canals in the seasonally flooded areas that allowed a fishing system in this interfluvial region (Prestes-Carneiro et al., 2019). In numerous other Amazonian regions, Indigenous Peoples built dams, diverted water courses and created artificial lagoons to obtain food resources such as fish and turtles, or store water in periods of scarcity (Erickson, 2008; Prestes-Carneiro et al., 2021).

Finally, it is important to highlight that, although most of the management practices listed above are practiced by humans, the entire landscape is occupied by numerous species, also active in building their niches that overlap with human niches. Some academic disciplines are valuing the multiplicity of agencies and subjectivities in the webs of relationships among living beings (Tsing, 2018; van der Veen, 2014). Although plants are understood in modern Western ontology as passive beings, different areas of science have gradually recognized that the plant kingdom is made up of individuals charged with agency and intelligence (Mancuso, 2018; van der Veen, 2014). In fact, if on the one hand, functional traits of plants are affected during domestication (e.g., life history, seed size, growth rate and heliophily) (Milla et al., 2015), such traits also influence how plant populations and landscapes domesticated by humans are managed, and how the successional dynamics of forests will occur (Lasky et al., 2014). The domestication of populations and landscapes transforms different levels of ecological organization in which animals that are herbivores, pollinators and dispersers are involved, in addition to many fungi that are involved in mutualistic relationships with plants (Milla et al., 2015). Thus, when humans relate to a plant, this entire network of relationships is transformed. In fact, one of the human management practices that leads to the domestication of forests is precisely the attraction of animals that, through their dispersal actions, con-

tribute to creating a greater abundance of food resources, both for humans and non-humans (Levis et al., 2018). Like plants, animals have their preferences and specific ways of modifying their niches, actively transforming domesticated landscapes.

Ethnic differences in landscape domestication

Archaeological and archaeobotanical records show that Amazonian Indigenous Peoples have had different ways of life for thousands of years, and this diversity of management systems and forms of occupation of territories persists today (Denham; Donohue, 2022; Iriarte et al., 2020). According to their own cultural choices (Rival, 2007), some people are less territorially mobile and obtain much of their food through cultivating fields and managing fallows, while others are more mobile and rely mainly on forestry products obtained through management. Although the degree of mobility varies among Indigenous Peoples, most combine different dietary strategies that involve plant cultivation, forest management, gathering, hunting and fishing (Denham; Donohue, 2022). The diversity of food preferences, management and subsistence systems found among Indigenous Peoples contributed – and continues to contribute – to the formation of the mosaics of cultural landscapes that make up Amazonian forests (Balée, 2013). Here we describe some aspects of some of these systems to illustrate how Indigenous Peoples who speak different languages and, therefore, with cultural differences, construct different cultural niches.

People with less territorial mobility – Baniwa and Kayapó

The Kayapó live in villages along tributaries of the Xingu River, in the states of Pará and Mato Grosso. The language spoken by the Kayapó, who call themselves Mebêngôkre, belongs to the Jê linguistic family, from the Macro-Jê trunk. The Mebêngôkre are horticulturists and cultivate a wide variety of plants in their swiddens and gardens, including sweet potatoes (*Ipomoea potatoes*), yams (*Dioscorea* spp.), manioc (*Manihot esculenta*), bananas (*Musa* spp.), maize (*Zea mays*) and squashes (*Cucurbita* spp.) (Robert et al., 2012). Generally, new swiddens are opened close to villages, in areas of mature forest, and their productivity reaches a peak in two or three years (Posey, 1985). However, as ecological succession occurs in the swiddens, the Mebêngôkre continue to actively manage them, as many species continue to produce for decades, and others, such as Brazil nuts, begin to produce 20-40 years after planting. Thus, fallows, which are old swiddens, continue to serve as a source of food and medicinal resources (Posey, 1985), seed banks, and as hunting areas because they are very attractive to animals (Robert et al., 2012). In this sense, the occurrence of concentrations of various species in the forests, such as Brazil nut, babassu (*Attalea speciosa*), bacaba (*Oenocarpus distichus*), among others, is understood by the Mebêngôkre to be occupations of their ancestors (Posey, 2002).

If the swiddens and gardens are intensely managed through cutting, burning and planting, the surrounding areas, frequently accessed for hunting, fishing

and gathering, as well as the trails used in these activities, also receive various human interventions. When traveling the trails, the Mebêngôkre execute two strategies to guarantee food and medicinal resources, among others: (i) planting various species along the trails, such as manioc, yam, sweet potato, and cocoyam (*Xanthosoma* sp.), and (ii) enrichment of areas with palms and trees and cane-arrow (*Gynerium sagittatum*) at some points along the trails, which are also hunting areas (Posey, 2002). In addition to intentional actions, seeds can fall from baskets between harvesting and returning to camp, further enriching Brazil nut groves and other stands of useful plants (Ribeiro et al., 2014).

The Mebêngôkre territory occupies forest and savanna areas in the Amazon-Cerrado transition (Posey, 2002). The Mebêngôkre transit this ecotone and use their knowledge of the two ecosystems to increase floristic diversity by transporting useful species from one formation to the other. Thus, they enrich clearings and marginal forest areas with useful species from the Cerrado, and create islands of forest in the savannas, which they call *apêtê* (Posey, 2002). The creation of *apêtê*s requires complex ecological engineering and begins with the incorporation of termite mounds, pieces of anthills and straw into the soil. In the enriched soil, the Mebêngôkre plant tubers, trees and palms. Often, plants grown in swiddens have characteristics selected by humans, such as flavor and texture. Thus, in addition to constituting domesticated landscapes, *apêtê*s are laboratories for the domestication of plant populations. Furthermore, the *apêtê*s are seen as hunting reserves since the preferred foods of the hunted animals are propagated in these places. Over time, these forest islands increase in size and are the scene of various cultural and daily practices of the Mebêngôkre (Posey, 2002).

The Baniwa inhabit the upper Rio Negro region, in Amazonas, and speak a language belonging to the Arawak linguistic family (Wright, 2005). The Baniwa recognize three main categories of forest landscape (Abraão et al., 2010): *aláp*e – forests seasonally flooded by black water rivers; *hamáliani* – open forests on sandy soils (campinarana); and *éedzawa* – closed-canopy upland forests on less sandy soils. The Baniwa's swidden cultivation system and forest management activities are mainly concentrated in the *éedzawa* areas due to the slightly more fertile soils, while villages can be opened in *hamáliani* areas. Although such villages are locally fixed, the Banwia have a certain territorial mobility due to hunting activities, gathering fruit and opening swiddens in remote locations (Franco-Moraes et al., 2019). Although currently the Baniwa mainly use rivers and streams to move around, in the past they mostly used trails in the forests (JFM & Glenn Shepard, pers. obs.). The Baniwa trails are demarcated by trees and local marks, such as logs in the ground or holes in the ground, and are important for hunting and gathering fruit, as this is how the Baniwa orient themselves in the forest.

The forest is, from the Baniwa perspective, a mosaic of swiddens, fallows and patches of ancestral forests, that is, forests that were once the swiddens of

their ancestors (Franco-Moraes et al., 2019). After being emptied during the colonial period by depopulation, these patches were transformed into forests that are visually indistinguishable from forests with no record of occupation (Wright, 2005). These ancestral forests have an abundance of species historically managed by the Baniwa, such as umari (*Poraqueiba sericea*), ucuqui (*Pouteria ucuqui*), bacaba (*Oenocarpus bacaba*), cupuí (*Theobroma subincanum*), umirí (*Humiria balsamifera*), among others (Abraão et al., 2010).

Forests managed by the ancestors of the Baniwa have a different floristic composition than unmanaged forests (Franco-Moraes et al., 2019). Managed forests have a greater relative abundance of useful species, equal biomass and less acidic soil. There is also a rare type of forest in Baniwa territory known as *makakanaueriko*, a forest where the Baniwa are not sure whether there was a swidden or not. The *makakanaueriko*, however, is an environment where they roam freely through trail systems, hunt and engage in activities such as gathering fruits and edible ants, and therefore cannot be considered a virgin forest since various social activities occur there, contributing to a modification of the forest system in a constant process of becoming, even without intensive management (Franco-Moraes et al., 2019).

***People with greater territorial mobility* – Maku and Zo'é**

Several peoples who speak languages commonly grouped in the "Maku" linguistic family, which includes the Hupd'äh, Nadëb, Dâw and Yuhupdeh peoples (in Brazil), and the Kakwa and Nukak languages (in Colombia) (Epps; Bolaños, 2017) live in the interfluves of the upper Negro River. During the 1990s, Gustavo Politis carried out extensive ethnographic and ethnoarchaeological work with the Nukak of the Guaviare River, in Colombia. He describes the Nukak ways of life and emphasizes the relationship between these people and their landscapes (Politis, 2007).

The Nukak's great mobility is one of their most outstanding characteristics. The groups move around their territory, settling for a few days in camps, without significant canopy openings. These camps serve as a base for their daily activities, and from there they carry out hunting, fishing, collecting plants, insects and products such as honey, in addition to small-scale horticulture. Nukak mobility is even greater during the dry season (Politis, 1996).

Among the plant species most sought after by the Nukak in the forest are the patauá (*Oenocarpus bataua*) and the sororoca (*Phenakospermum guianensis*). Depending upon the season, the Nukak also collect fruits of buriti, sorva (*Couma macrocarpa*), bacabinha (*Oenocarpus mapora*), paxiúba (*Socratea exorrhiza*), inajá (*Attalea maripa*), tucumã (*Astrocaryum aculeatum*), among others (Politis, 1996; 2007). The fruits are collected in large quantities and transported to the camp where they are processed and consumed. Among these species, many have populations domesticated to some degree and form aggregations in forests (Levis et al., 2018). Some of the species most used by the Nukak,

especially the patauá, are found in large aggregations in different areas of their territory, because they are favored by protection and the abandonment of seeds around camps. As Nukak do not reoccupy the same places in the short/medium term, the resulting seedlings can develop if they find favorable environments and form forests rich in useful plants (Politis, 1996; 2007).

There is, however, a long-term tendency for some areas to be used again, reinforcing the increased abundance of their preferred species in the landscape (Politis, 2007). Thus, Nukak mobility can be understood as a way of concentrating resources in patches, which creates a reserve of plant resources for the future. In fact, the densities of peach palm (*Bactris gasipaes*) found in the Nukak territory are attributed to the forest management carried out by their ancestors, who used these areas for cultivation. Present generations no longer have this practice but recognize that their ancestors created these places through the consumption of peach palm fruits (Politis, 2007). The Nukak territory is an example significant landscape domestication in Amazonian interfluvial areas and is nearly independent of the existence of cultivation systems.

The Zo'é are a recently contacted people who live in interfluve forests between the Cuminapanema and Erepecuru rivers, north of the Amazon River in the state of Pará, and speak a language belonging to the Tupí linguistic trunk (Iepé; FPEC, 2019). The Zo'é have high territorial mobility and are divided into four local groups that alternate periods in semi-permanent villages with periods in temporary camps, and their management system includes swidden-fallows, hunting, gathering and fishing. Such activities are organized seasonally, and during the rainy season the collection of Brazil nuts, inajá, bacaba and patauá takes place. The dry period is marked by the maturation of açaí and tucumã, and it is during this period that the Zo'é hunt specific animals that consume these fruits (Braga, 2021).

A key concept for understanding Zo'é forest management is *tekoha*, a concept that means "social territory" (Braga, 2021). According to Zo'é cosmology, animals and plants have volitions and interact through partnerships, revenge, war etc. (Franco-Moraes et al., 2023). The places where social relationships (involving humans and/or non-humans) occur represent a *tekoha*, as it is the development of these relationships that promotes a *tekoha*, which is a place where beings grow their food, hunt, sleep etc. For the Zo'é, all beings have their own *tekoha* (Franco-Moraes et al., 2023).

The Zo'é manage their forests mainly through their mobility associated with the opening/vacating of forest patches, and such management does not seek to create useful forests but rather to guarantee moderate behavior when hunting and the possibility of the existence of different *tekohas* of humans and non-humans (Franco-Moraes et al., 2023). Zo'é management focuses on the resilience of local social relations, among humans and non-humans, associated with the production of their own social territory through an ethic of modera-

tion (Aparicio, 2020), that is, through decorum and precautionary behaviors towards non-humans (Braga et al., 2020). The opening/vacating of forest areas by the Zo'é is structured by an ethical principle that involves socio-ecological relationships with various beings, mainly with the spider monkey (Franco-Moraes et al., 2023). Such relationships generate high mobility among the Zo'é, which allows forest regrowth in areas of unoccupied swidden/fallows, so that in ~28 years the basal area of these forests is equal to that of mature forests. Furthermore, Zo'é forest management increases species richness and diversity in intermediate secondary forest areas of former swidden/fallows (increased alpha diversity) and promotes floristic renewal at the landscape level (increased beta diversity) (Franco-Moraes et al., 2023).

Domesticated Amazonia

Since the 1980s, when archaeologists and historical ecologists began to demonstrate that Amazonia is full of domesticated landscapes, the question of what the scale of this domestication might be has generated debate. The hypothesis that more intensely domesticated landscapes are more common where Indigenous populations were larger, for example along large rivers, is widely accepted (Clement et al., 2015). Then the interfluves became the center of the debate, even though different models of human occupation (McMichael; Bush, 2019), population growth (Riris; Arroyo-Kalin, 2019), probability of finding sites with Amazonian Dark Earths (McMichael et al., 2014), forests in succession (Palace et al., 2017) and distribution of useful species (Levis et al., 2017) suggest that the majority of Amazonia has been domesticated to some degree. The reason for the debate about domestication in interfluvial areas is the lack of evidence in these regions, as researchers have carried out most of their studies in areas close to large rivers because access is easier (Hopkins, 2007), and the assumption that people of high mobility – more common in interfluvial areas – did not intensively domesticate landscapes, which we demonstrated above to be unfounded.

The scale of domestication in Amazonia depends on three factors: population of human communities, distribution of such communities, and length of occupation in the region. Humans arrived in Amazonia at least 13 thousand years ago (Shock; Moraes, 2019). Early occupation models suggest that humans occupied both larger and smaller rivers (Riris; Arroyo-Kalin, 2019), as mentioned. What we don't know is the size of the Indigenous population at the time of conquest. William Denevan worked on this issue for decades, refining a carrying capacity model of major Amazonian ecosystems and arriving at an estimate of 5-6 million people (Denevan, 2014). When the existence of Amazonian Dark Earths was considered, the estimate expanded to ~10 million (Woods et al., 2013). But, Thomas Myers, who worked in Western Amazonia, suggested that twice as much is more likely (Myers, 1974).

A detail that none of these scholars considered is that good living in Amazonia did not depend solely on horticulture (Shepard Jr. et al., 2020). As we demonstrated with the examples above, both people who practiced more horticulture and those who practiced little domesticated the forests around their settlements, creating aggregations of fruit trees and palms. Some of these fruit species are hyperdominant in Amazonia (ter Steege et al., 2013), partially due to human action (Levis et al., 2017). Six of these species can produce more protein and other nutrients than all the cattle in Amazonia today (Table 1), which contradicts agribusiness claims that only extensive monocultures can produce abundant food. In addition to these six, half of the five thousand tree species recorded in Amazonia are useful to humans and 46% of these produce edible fruits (Coelho et al., 2021). In gardens, swiddens and agroforests, Indigenous Peoples domesticated dozens of annual plants and hundreds of perennial plants to varying degrees (Clement et al., 2021). Furthermore, rivers, especially white-water ones, provide fish and other animals, and domesticated landscapes provide game, mushrooms, and insects. Over the past 13,000 years, the domestication of Amazonian landscapes has increased the food supply to sustain populations of Indigenous Peoples (Flores and Levis, 2021) to such an extent that early European accounts emphasized good Indigenous health and the abundance of food in villages (Denevan, 2014)..

Table 1 – Estimates of food (fruit pulp or seed) and protein production of six hyperdominant arboreal species of the Amazonian flora in order of abundance (ter Steege et al., 2013)* and their equivalent in millions of 500 kg cattle (which have 42.5 kg of protein)

Order	Species	Abunance	Pulp (t)	Seed (t)	Protein (t)	Cattle (M)
1	*Euterpe precatoria*	$5{,}4 \times 10^9$	$3{,}2 \times 10^7$		$6{,}5 \times 10^5$	15,3
6	*Oenocarpus bataua*	$3{,}6 \times 10^9$	$2{,}3 \times 10^7$		$7{,}6 \times 10^5$	17,8
7	*Euterpe oleracea*	$3{,}6 \times 10^9$	$2{,}2 \times 10^7$		$4{,}3 \times 10^5$	10,1
22	*Mauritia flexuosa*	$1{,}5 \times 10^9$	$1{,}5 \times 10^7$		$2{,}3 \times 10^5$	5,3
24	*Theobroma cacao*	$1{,}4 \times 10^9$		$2{,}0 \times 10^6$	$5{,}9 \times 10^4$	1,4
178	*Bertholletia excelsa*	$4{,}0 \times 10^8$		$4{,}0 \times 10^7$	$6{,}0 \times 10^6$	141,2

* These authors did not consider that deforestation has destroyed 20 % of Amazonian ecosystems, nor that another 20% are degraded, so the abundances represent possible premodern populations of each species.

Source: Clement (2019).

Existing evidence suggests that the Amazonian biome was transformed because of thousands of years of domestication of its landscapes. However, the myth of pristine forests continues to stimulate the imagination of Brazilians

and other world citizens (Denevan, 2011), which has repercussions on public policies for conservation and regional development (Clement, 2019; Clement et al., 2020).

The Capitalocene, a more appropriate term for the Anthropocene, comes from a narrative of world domination by European countries that resulted in the current capitalist system (Graeber; Wengrow, 2021). But other worlds are possible, as Indigenous thinkers argue (Kopenawa and Albert, 2013; Krenak, 2019). If the Indigenous Peoples of Amazonia have always been able to guarantee a good life with standing forests, we can certainly learn something from them to redirect the development of Amazonia.

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ABSTRACT – In the popular imagination, Amazonia is a natural biome, which denies the existence and agency of Indigenous Peoples who arrived at least 13,000 years ago. This essay will demonstrate that Amazonia is a web of socio-ecological interactions, as a result of the domestication of landscapes and populations of species. The practices involved in the domestication of landscapes are simple, yet based on deep knowledge, and respectful of non-humans. Indigenous Peoples combine horticulture and landscape domestication, as well as sedentary lifestyles and mobility. The Mebêngôkre (Kayapó) and Baniwa practice more horticulture, while the Nukak and Zo'é are more mobile, and the domestication of their landscapes reflects these differences. Domesticated forests produce as much food as swiddens and fallows, all leading to forest maintenance or regeneration. These practices suggest that national and global societies can learn to produce food in the standing forest, which would contribute to mitigating the effects of the Anthropocene.

KEYWORDS: Amazonia, Landscape domestication, Plant domestication, Indigenous Peoples, Human-non human relations.

RESUMO – Na imaginação popular a Amazônia é um bioma natural, o que nega a existência e agência dos Povos Indígenas que chegaram a pelo menos 13 mil anos. Este ensaio demonstrará que a Amazônia é uma teia de interações socioecológicas, como resultado da domesticação de paisagens e de populações de espécies. As práticas envolvidas na domesticação de paisagens são simples, embora baseadas em conhecimento profundo, e respeitam não humanos. Os Povos Indígenas combinam horticultura e domesticação de paisagens, bem como sedentarismo e mobilidade. Os Mebêngôkre (Kayapó) e Baniwa praticam mais horticultura, enquanto os Nukak e Zo'é são mais móveis, e a domesticação de suas paisagens reflete essas diferenças. Florestas domesticadas produzem alimentos tanto quanto roças e capoeiras, todas levam a manutenção ou regeneração da floresta. Essas práticas sugerem que as sociedades nacional e global podem aprender a produzir alimentos com a floresta em pé, o que contribuiria a mitigar os efeitos do Antropoceno.

PALAVRAS-CHAVE: Amazônia, Domesticação da paisagem, Domesticação de plantas, Povos Indígenas, Relações humanas-não humanas.

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