Land Use in the Amazon in the Colonial Period

Rafael Chambouleyron and Pablo Ibáñez-Bonillo

The debate about the relationship between humanity and nature has been extensively developed through archeology for the period before the arrival of Europeans in the Amazon; likewise, this subject has also been the subject of study for ethnohistorians and anthropologists who, in different locations of the greater Amazon region, have studied the multiple relationships between Indigenous societies and the environments they inhabit. This debate, in fact, formed the backbone of research on Amazonian Indigenous peoples throughout the twentieth century, giving rise to conflicting hypotheses about their ability to adapt or transform the tropical landscape. From the most conservative perspectives, the Amazon was held to be one of the most inhospitable places on the planet and generally incompatible with the development of civilizations (Steward 1948; Meggers 1971). People in this part of the world suffered adapting to its soil and wet climate, making survival an accomplishment.

However, sufficient scientific evidence has accumulated in recent decades to overcome these initial paradigms (Myers 1992; Faust 1999; Mann 2006). Today, scholarship accepts that the Amazon is indeed a challenging and complex place, but this is, in part, thanks to the action of human groups who, throughout the centuries, were able to take advantage of forests and rivers to increase its performance and habitability (Heckenberger and Neves 2009; Schaan 2008–2009; Roosevelt 2013; Clement et al. 2015). Thus, before the Europeans' landing, native societies shaped the Amazon region (both on riverbanks and the interior) in a long process of observation, learning, trial, and error that has only begun to be understood. This includes a wide variety of workarounds: anthropic forests created by groups that practiced seasonal extractivism; deposits of fertile black soil thanks to the undecipherable alchemy of organic waste; elevated platforms to cope with river floods; savannas opened with controlled fires (Erickson 2008; Schaan 2004; Franco Moraes et al. 2019). These are among a long list of creative responses that contribute to the understanding that, first, the Amazon was neither in the past nor present a virgin and natural place but rather a historical and social one (Heckenberger et al. 2003; Hecht et al. 2014), as also suggested by the first European chronicles of the sixteenth century (Wilkinson 2016; Porro 2020); second, that human action prior

to the arrival of Europeans had profound influences on the way they colonized the region; and finally, that European conquest and colonization brought with it new forms of relationship with nature, as well as a series of changes in the scale and form of land exploitation with the introduction of more systematic agriculture and metal tools (Shepard Jr. et al. 2020; Neves 2013; Denevan 1992a).

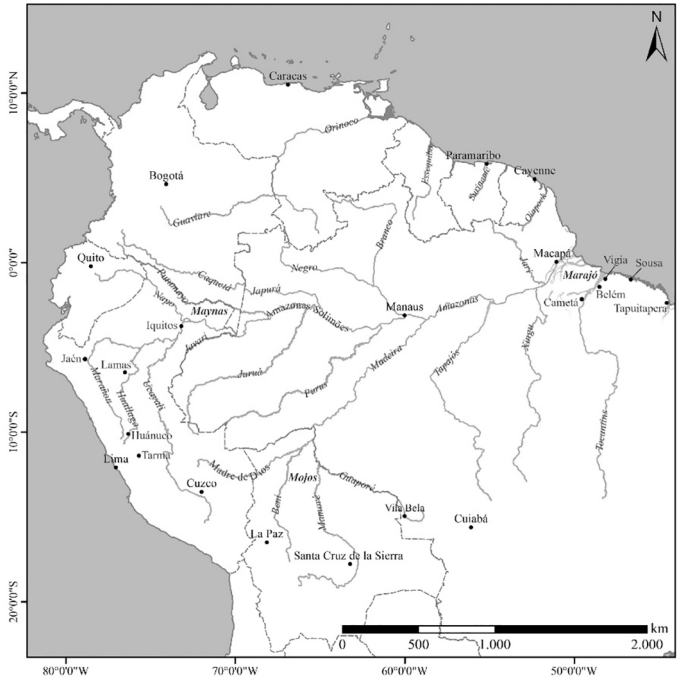
These fruitful discussions on socio-environmental relations, which have helped to make our perception of the Amazon more complex and diverse, contrast the more minor interest shown by historians, at least for the colonial period (the sixteenth to early nineteenth centuries). Two reasons help to grasp how little historians have contributed to these debates beyond some valuable exceptions (Cleary 2001). On the one hand, topics related to environmental history for the Amazon in the long term have been traditionally developed by anthropologists or archaeologists in a disciplinary trend that has complicated the dialogue with other thematic currents of historiography. These disciplines have emphasized the diversity of Amazonian ecosystems (overcoming old simplifying stereotypes) and their complex historical relationship with Indigenous peoples. On the other hand, colonial Amazonian historiography is still under construction, lacking many of the hallmark contributions that exist for other regions, such as the history of its economy, internal markets, or exchange circuits. Eluded by different national historiographic traditions that perceive the Amazon as a peripheral and marginal space to the respective Latin American republics, the history of the colonial Amazon still requires the attention of generations of historians who, through their work, can improve our knowledge of the region's past. Despite this, through the literature produced on adaptation to the environment and its transformation in the colonial period, it is possible to reflect on the perception of various impacts on the environment and the solutions imagined (and applied), the varied uses of the land, as well as on the different narratives and perspectives that the imposing Amazon region provoked in the mindset of the European conquerors and colonizers.

This chapter deals with all these issues and is divided into five thematic and chronological sections. The first of these addresses, in point of fact, the varied colonial representations of the Amazonian space from the first voyages of discovery in the sixteenth century. The second section analyzes the colonization projects of the Iberian monarchies, through which they tried to control and exploit the Amazon territory during the colonial period. These projects were especially numerous and original in the eighteenth century, coinciding with the Enlightenment reforms attempted throughout the continent, which are discussed in the third section of this text. In the fourth section, the chronological progression is abandoned to address the different modes of exploitation experienced in the region in order to, finally, close the text with some considerations about the environmental impacts caused by colonial land use.

Representations of the Conquest

One of the historical features of the Amazon region is its late (and precarious) incorporation into the Iberian colonial realms. The absence of mineral riches, difficulties in exploring tropical forests, and diseases, among other reasons, discouraged the recognition and colonization of these spaces. Thus, since the sixteenth century, several expeditions had entered the region (without much success). Only in the seventeenth century were ambitious attempts to control the Amazon regions by the different European empires. Thus, the Amazon remained a considerably unknown region for soldiers and settlers living in colonial cities, usually near the Atlantic or Pacific coast. And much more still for the metropolitan societies of Europe.

Fig. 1: The Amazon Region



Source: LAIG/UFPA and authors.

This remoteness provoked several legends and stereotypes, fueled by a few chronicles of European explorers, some Indigenous myths, and medieval Europe's predictions. Such a set of representations marked the historical development of these lands and continues to guide the global perception of the Amazon, represented

as a natural space, wild, not yet domesticated, and hiding wonderful treasures that must be revealed. Perhaps the most important of these legends, at least in the early colonial period, was that of El Dorado, which, in its different versions (Paititi, the kingdom of Moxos, among others), acted as a magnet for the conquerors. From the main cities of Spanish America, such as Cuzco or Quito (see Fig. 1), groups of men set out in search of unlikely fortunes associated with the recent conquests of Peru, which had been generous in silver and gold (Bayle 1943; Levillier 1976; Gil 1989; Livi Bacci 2007).

Their repeated failures known in Europe thanks to several chronicles, constituted the material with which Europeans forged the colonial representations of the region. These were evocations that oscillated from the earliest times between two stereotypical poles: on the one hand, the Amazon was imagined as a space of opulence and possibilities, a repository of wealth, food, and treasures that were offered to the most ambitious conquerors (Ugarte 2009). On the other, however, harsh physical and climatic conditions, as well as resistance from Indigenous peoples (numerous and threatening), seemed to doom attempts to seize these resources. The Amazon was, therefore, paradise and hell at the same time, an ambivalence that endured throughout the colonial period and, to this day, persists in the multitude of representations of the region (Gondim 1994; Pizarro 2009; Slater 2015).

Thus, the powerful image of the El Dorado and other legends influenced Spanish explorations during the sixteenth century and also exerted its influence on the Portuguese, who settled in the Amazon only in 1616 as part of an Iberian campaign of occupation of the territory. From then on, Portuguese representations of the Amazon arose, becoming much more numerous from the 1640s onwards, after the restoration of the Portuguese crown and the end of the Iberian union between the crowns of Portugal and Castile (1580–1640). The search for metals and precious stones in the Portuguese Amazon was also a constant throughout the seventeenth and eighteenth centuries, but the stories mainly focused on plant riches (Cardoso 2015). A relationship with the East was established here, echoing the glorious days of the Portuguese empire with the spice trade. Thus, the region was called "Eastern Peru" by Captain Simão Estácio da Silveira in 1624 because of an alleged abundance of cloves, fruits from the East, and cinnamon, products that had also attracted the interest of the Spanish conquistadors (Silveira 1624).

The subsequent discovery of tree bark with a similar smell and taste to Eastern cloves largely confirmed these early representations. Although the so-called *cravo do Maranhão* was a different plant, the Portuguese crown saw in the product a substitute for the famous spice and the possibility of resuming its place in the trade of these types of goods. The inability to cultivate the tree, however, ruined their hopes. In any case, the existence of a clear substitute for oriental products led the crown and government officials to seek new goods that might be of commercial interest. To this is added the existence of vast native cacao orchards along the Amazon River and

in several of its tributaries, which is possibly the result of centuries-old anthropic action.

In this context, Portuguese writings begin to represent the Amazon region as a territory full of potential from the point of view of economic exploitation. It was hardly an almost mythical projection, such as El Dorado, but a way to conceive of Amazonian nature as a source of possible wealth that was the responsibility of the Portuguese to reveal (with the indispensable help of the Indigenous people). Not without reason, the verb *discover* becomes frequent in the reports of officials to the court. The role of Indigenous people here was fundamental, as rowers and guides: the holders of geographical knowledge often codified in rituals and mythical narratives (Hill 2011).

Beyond more or less realistic speculation, the truth is that Europeans tried to turn these lands into productive spaces, establishing various forms of economic organization. From the end of the seventeenth century and throughout the colonial period, the economy of the Amazon, both Spanish and Portuguese, was based on the exploitation of several of these forest goods, mainly cocoa (also cultivated), *cravo do Maranhão* (clove bark), sarsaparilla, copaiba oil, as well as fruits, barks, roots, and resins obtained by extraction in the vast Amazon continent. These extractivist activities reported benefits thanks to the enslaved or semi-enslaved labor of Indigenous populations.

Colonization Projects: Missions and Cities (Seventeenth Century)

This model of exploitation, however, did not guarantee the colonization of the territory and, consequently, its effective occupation, at least for the traditional patterns of occupation in the Americas. This was not a minor issue in these vast regions with still indefinite borders over which the major European powers contended. That is why both Spanish and Portuguese colonizers attempted to establish themselves permanently through the foundation of cities. In the case of Hispanic America, this founding impulse had accompanied reconnaissance expeditions since the sixteenth century in the form of capitulations signed between the crown and the conquistadors, who undertook founding new cities in the lowlands. In this manner, several cities came to be founded, especially in the eastern region of Quito, but also in other transitional zones between the Andes and the Amazon (Moyobamba, Santa Cruz de la Sierra, etc., and in the Orinoco River as well (see Fig. 1). However, many of these settlements succumbed within a few years to some factors, including the lack of communications or the hostility of Indigenous peoples (Taylor 1999).

Better luck befell the Portuguese settlements of the seventeenth century, especially the city of Santa Maria de Belém do Grão-Pará, the leading Portuguese position in the Amazon, founded in 1616. Belém, as it was known, became the great city of the

colonial Iberian Amazon, thanks to its strategic position at the mouth of the Amazon River, becoming the central axis of communication for the region. In its shadow, other small towns (*vilas*) established in private captaincies (later incorporated into the crown in the mid-eighteenth century) sprouted, such as Cametá, Sousa, Vigia (in the captaincy of Pará), and Tapuitapera (in the captaincy of Maranhão). However, the number of towns and cities remained small during much of the colonial period, due to both the absence of a founding initiative and challenging environmental conditions.

Also, in the vicinity of Belém, properties for inhabitants of the city and religious orders were gradually established. Located on the banks of the rivers, they cultivated sugar cane, beans, cocoa (from the end of the seventeenth century), and, foremost of all, cassava, the "daily bread" of the land, as a Jesuit missionary wrote (Daniel 2004). The Portuguese crown recognized possession of land and began distributing titles (*sesmarias*) to those who had already occupied or asked for new land from the end of the seventeenth century. In any case, no extensive holdings were established in the colonial Amazon, although available land was abundant.

Thus, at least until the mid-eighteenth century, large landowners in the Portuguese Amazon were not necessarily owners of large tracts but instead of medium-sized properties scattered throughout various parts of the territory, each with its specialization (cattle, sugar, cocoa). This entailed a particular relationship between the rural world and the city since the properties of the inhabitants of Belém were located some distance away from it (and sometimes a considerably long way). The mobility of the colonial population is a fundamental aspect of the Amazonian world, which is evident from the recurrent movement of landowners between the city and their land or between the city and the *sertões* (hinterland), where forest products were collected, Indigenous people were enslaved, and Indians sent to the mission villages (Sommer 2005).

While living alongside the whites' properties, a type of property without legal titles became established little by little in the Amazonian world, close to the towns and cities, cultivated generally by Indians, mestizos, and Maroons. From these cases, the historiography discusses the emergence of an Amazonian peasantry (Acevedo Marin 2000; Costa 2019), an elusive category still today in socio-historical analysis, due, among other factors, to the particularities of land uses in the region (Nugent 2002; Adams et al 2009; Harris 2010). In the documents of the late seventeenth and mid-eighteenth centuries, these small growers appear in a fragmentary form. However, a census for the 1770s and 1780s makes their presence clear. In the village of Cametá, on the Tocantins River, for example, next to several white owners, several individuals designated as "mamelucos" or "índios" also appear, who live off the cultivation of cacao – "*vive do seu cacoal*" – or the cultivation of manioc and other goods – "*vive da sua roça*" – often indicating the use of family labor (Arquivo Histórico Ultramarino 1785).

The use of land by individuals (in the form of haciendas, for example) who took advantage of forced Indigenous labor, through encomiendas and other labor relations, also occurred in the Spanish Amazon. These farms were generally concentrated in the region of the *montaña*, or high forest, near Andean cities in places like Jaén de Bracamoros, Huánuco, Tarma, or Lamas. Among the products exploited were tobacco, sugar cane, bananas, sweet potatoes, chili, and, especially, coca, which from its origin in the wet valleys, exerted a powerful cultural influence within the Andean cosmos in the era before the Spanish conquest. The impact and extent of these initiatives must still be systematically studied, although the scarcity of sources makes the work difficult (Santos Granero 1985; Santos Granero 1992). The presence of Andean and Spanish settlers was less significant in the lowlands, where the agricultural use of land by individuals was more limited. Instead, it is worth noting the relevance of religious missions of different orders that have operated in these regions since the beginning of the seventeenth century.

Religious orders such as the Jesuits, Franciscans, Carmelites, Mercedarians, Dominicans, and Augustinians arranged the Indigenous populations in reductions that would facilitate their governance and conversion, both for the Spanish and Portuguese Amazon. Thus, until the mid-eighteenth century, the colonial occupation of part of the Amazonian territory was, in fact, eminently missionary. The establishment and management of these mission villages resulted from negotiations between the missionaries and their neophytes (Arenz 2014; Carvalho 2015), who, in most cases, chose the locations where they wanted to install the missions. These were founded on the banks of the main navigable rivers, usually near their confluence with the Amazon. River navigation was the primary means of transport in the Amazon. Living near rivers allowed communication with other missions, fishing, agriculture, trade, and gathering on nearby lands. This does not mean that Indigenous people did not open and use land roads. However, their contact with the interior occurred rather through rivers and canals (*igarapés*, *igapós*, *furos*), which they maintained and created according to their interests (Raffles 2002). This was a subtle geography that connected riverbanks with inland areas (*terra firme*), thanks to historical patterns of mobility and trade (Whitehead 1993; Zárate Botía 1998).

Negotiations, loans, and hybridizations between the Indigenous and the missionaries can also be observed in the productive activities that they developed (Sweet 1995; Ravena and Acevedo Marin 2013; Chambouleyron, Arenz, and Melo 2020). Indigenous peoples had extensive experience using the land for subsistence, and there are indications of some resource accumulation. The missionaries adapted these local customs while trying to establish more stable agricultural practices in the vicinity of the missions, which ultimately affected the fertility of these lands and altered previous extractive patterns, as appears to have occurred in the Mojos missions in the territory of present-day Bolivia (Block 1994: 58–59). There, as in other mission complexes, the cultivation of native products was combined with the introduction

of new crops, as well as with livestock and some local crafts (textiles, pots, among others), generating a regional economic system (Santamaría 1987). Such systems often overlapped with Indigenous patterns of regional integration (with their routes, products, and trade), such as the one organized around the Cerro de la Sal (Ryden 1962; Varese 1973).

Natural phenomena constantly threatened these activities and put mission continuity at risk. Floods, epidemics, droughts, insect pests, and other more human causes (such as Indigenous rebellions or attacks by other European powers) prompted the recurrent relocation of missions, always searching for new, healthier sites. The mobility of human settlements, their presence often only temporary, was, in fact, one of the characteristics of the colonial Amazon. At the same time, the demography of the missions was also affected by these issues, as well as by the escapes and the continuous visits that the Indigenous people made to their relatives or to their former lands (Carvalho Júnior 2003; Livi Bacci 2012; Roller 2014). This also led to the merger or abandonment of specific missions, and the relentless search for neophytes to repopulate settlements.

Enlightenment Projects (Eighteenth Century)

The European military also established some positions with a greater desire to remain, especially the Portuguese, who dotted the Amazon River with a series of forts from which they intended to control river navigation and which also constituted populated locations. In these forts lived small garrisons of soldiers who had to occasionally move their settlements owing to strategic defense reasons rather than environmental threats. In this sense, one should note that the concentrations of rocks that prevented or hindered navigation in the middle and upper reaches of the rivers (*cachuelas*, *cachoeiras*), as well as the narrowest sections of the channels (*estreitos*), were identified by the Europeans as natural solutions to aid the installation of their positions and defense of their borders (Viana 2021).

These borders, on the other hand, were illusory during the colonial period. Reliance on navigable river courses and dense vegetation cover limited European knowledge of inland regions, and only in the mid-eighteenth century there was a realistic aspiration to acknowledge the integrity of the Amazonian borders and fix their positions. After the signing of the Treaty of Madrid (1750), seizing the momentum of the scientific expeditions that had traveled the region in the first half of the eighteenth century, the two Iberian crowns agreed to send boundary commissions that were to demarcate the territory jointly. These commissions, and those resulting from the later Treaty of San Ildefonso (1777), failed not only because of the tides of European diplomacy but also because of the difficulties of the terrain and to secure provisions in those remote places.

In fact, by the mid-eighteenth century, the Amazon was still a poorly known and poorly managed space for both crowns. The crowns had previously delegated to religious orders the conversion of Indigenous peoples into servants of God and the king, but the result appeared insufficient to them. For this reason, in the context of the Enlightenment reforms and the Jesuits' fall from grace, a series of new colonization projects were developed in the region. In the Portuguese Amazon, these projects included elements such as the prohibition of Indigenous slavery and the secularization of religious villages. The *diretores* took the place of the missionaries. These local administrators were to guard Indigenous freedom in the former missions following the precepts in the ninety-five paragraphs of the so-called *Diretório dos Indios* (Directorate of Indians) (1758).

Many of the Directorate's paragraphs were devoted to promoting two key economic activities: trade and agriculture. Agriculture was perceived as a factor of civilization that was to be adequately stimulated. The directors were to explain to the natives that cultivating the land was a "useful and honest" exercise, examining whether the surrounding land was competent and ensuring that all Indigenous people had access to it. In this way, it was intended to provide the natives with valuable lands to encourage their individual and familial development. In addition, agricultural work would make it possible to deal with a recurring problem: the lack of food and its shortage in colonial markets. To do this, Indigenous people were encouraged to plant cassava (the basis of Amazonian food), as well as beans, corn, rice, and other edible goods (Sampaio 2012; Coelho 2016).

The Directorate also pursued the production of exportable goods. Unlike the plantations that bore fruit elsewhere, such as in the French and Dutch Guianas (Cardoso 1999; Cruz, Hulsman and Gomes 2014; Whitaker 2016), the Iberian Amazon had not yet developed a planting economy of goods such as sugar, cotton, or tobacco, mainly because of difficulties with land and communications. The production of the *vilas* of the Directorate was now to be counted, stored, and sent to the general treasury in the city of Belém, where the natives would be paid for the fruits of their labor. Other products of economic interest, such as so-called "*drogas do sertão*" (cocoa, clove bark, sarsaparilla), turtle fat, salted fish, or various vegetable oils, were brought there.

With these measures, the missions became *vilas* and *lugares* that aspired to settle populations (shunning the usual desertions and previous mobility) and transform land uses. In the same spirit, the foundation of new villages, the opening of new supply routes, and the massive introduction of livestock were also planned to help combat chronic food shortages in the Iberian Amazon. The large-scale insertion of African enslaved people was also promoted, who, until the mid-eighteenth century, had represented a relatively small portion of colonial society.

Authorities adopted similar measures in the Spanish Amazon, most notably after the expulsion of the Jesuits in 1767. A royal charter of 1772 indicated how to man-

age the ancient Jesuit missions of Maynas following the example of the Jesuit missions of Uruguay and Paraná (Goulard 2011; Bastos 2017). In addition, other policies were implemented as part of the Bourbon Reforms to integrate these eastern regions (Lucena Giraldo 1993; Aburto Cotrina 1996; Gómez González 2014). Exploration of the territory, the opening of new roads, the creation of villages, the introduction of livestock, and other measures were tried to improve the governance and exploitation of those lands. The reform plans (especially by Governor Manuel Centurión) for the Province of Guiana, located between the channels of the Orinoco and Amazon rivers, stand out in this era (Lucena Giraldo 1991; Amodio 1995).

These projects reflect the transformative will of the Iberian crowns, which encouraged scientific exploration travels to identify and describe the natural potential of the Amazon (Peralta 2006; Safier 2008; Pataca 2006). In this process, Indigenous knowledge was again fundamental, influencing cartography or botany at the time (Chauca Tapia 2015; Sanjad, Pataca, and Santos 2021). Both crowns, therefore, aspired to give definitive momentum to the region, convinced that will and good governance were sufficient to overcome environmental impacts and constraints. However, their confidence was excessive, and most of the projects implemented in the second half of the eighteenth century failed or at least had a complicated implementation, yielding precarious results.

Land Use

The modes of production and land uses in the colonial Amazonian world, derived from the different colonization projects this chapter has discussed in the previous pages, had uneven environmental implications. One can differentiate between three main land uses: extractivism, agriculture, and livestock.

The first of these was the most representative of the colonial period since it was present since the first expeditions of discovery and conquest. The famous expedition of Gonzalo Pizarro, which would lead to the first European navigation of the Amazon River's course by Francisco de Orellana in 1541–1542, aimed to find the "Country of Cinnamon," a product that did not grow naturally in the Amazon. However, it did encounter another series of goods that, in the three centuries after, have attracted the interest of extractive expeditions from both sides of the border: cocoa, cinchona, clove bark, sarsaparilla, and indigo, in addition to animal products that required hunting and fishing activities: various types of fish (to consume fresh or dried), manatees, turtles (Fiori and Santos 2015), bird feathers, among others. And, of course, wood for the construction of houses and canoes, as well as wood for export (for the production of ships, for example) and resins. In short, a wide variety of materials that did not require cultivation and hardly required mobile harvesting equipment.

Therefore, much of the economic development of the colonial Amazon was based on harvesting the fruits that (naturally or anthropically) grew in the region, taking advantage of the ethnobotanical knowledge of Indigenous peoples, whose complexity scholars revealed in recent decades (Posey 1985; Balee 1994; Pineda Camacho 1999; Rival 2002). However, colonial agents also attempted to domesticate some of these harvestable products. Thus, with certain products there was a mixed exploitation, combining traditional harvesting with the cultivation of certain varieties in small and medium plantations. This controlled planting reduced costs and risks, avoiding the extinction of certain trees and bushes that would have resulted from more abusive extraction. On the other hand, it was based on the idea of agriculture as the ideal way to exploit the region's riches.

Take the case of cocoa and *cravo do Maranhão* (clove bark), the two most important goods for exploitation and export in the Portuguese Amazon region. Throughout the colonial period, mainly up to the late eighteenth century, cocoa was extensively exploited by harvesting of wild fruits in the cacao orchards that existed along some of the major rivers in the region. Despite the importance of cultivation, it seems that much of what was exported was from the harvest of the so-called *cacao bravo* (wild fruits) in the *sertões*. Even so, descriptions of the region since the mid-eighteenth century maintain an image of abundance regarding the native cacao orchards (Sampaio 1825), which may mean that extraction, although intense, did not come to threaten the very existence of cacao trees.

The case of the *cravo do Maranhão* was different. Although the only thing that interested the Portuguese was the bark, workers cut the whole tree to extract it. Not without reason, the Jesuit João Daniel, who lived in the Amazon in the first half of the eighteenth century, had complained that the Portuguese only took advantage of the tree "one time in life," which led to the disappearance of "extensive cravo plants" (Daniel 2004). Many years earlier, in 1686, the king himself acknowledged in a letter to the governor that he feared "with probable certainty of [the cravo's] extinction." Evoking the ancient and devastating experience with the principal wood of the Brazilian Atlantic coast, he warned that "in terms of harvesting [the cravo] it happens the same as brazilwood" (Arquivo Histórico Ultramarino, 1673–1712, f. 52v).

Exploiting the *drogas do sertão* entailed a particular type of land use in the Amazonian world, especially in the Portuguese territory. The vast cacao orchards of the hinterland, strictly speaking, had no owner or proprietor; the same can be said of the clove bark tree or sarsaparilla plucked from the earth. They were exploited by expeditions going to the *sertão*, setting up temporary factories, harvesting the product, and returning to Belém (Pompeu 2021). In this sense, the places of exploitation of Amazonian products were not the domain or particular possession of white people, unlike rubber in the late nineteenth century, for example.

Concerning agricultural practices, they were attempted near the colonial settlements as a way of ensuring the livelihood of their inhabitants. One commodity

proved essential in this subsistence agriculture: cassava. Since well before the European conquest, Indigenous peoples had domesticated cassava and other plants (Clement et al. 2015; Shepard Jr. et al. 2020). Manioc was, in fact, one of the main foods of the colonial Amazon, along with fish, and remained so in the centuries after (to this day). The inhabitants of the missions and cities of the colonial Amazon used cassava as the basis of their diet in its different forms and derivatives (*mandioca puba*, manioc flour, cassava bread). The production of cassava was based on Indigenous techniques in small, scattered plantations, a pattern that remained essentially unchanged during the colonial period.

In addition to cassava, other native products were grown in the colonial Amazon. Agricultural land was also used to cultivate products introduced by Europeans to feed local populations (such as rice) or participate in export networks to the colonial capitals and/or European markets. Among these last goods, the role of rice itself, and marginally sugar (although plantations were less significant than in northeastern Brazil), cotton, and tobacco should be highlighted. These products and their derivatives (e.g., fabrics, cane liquor) also circulated within the Amazon, often serving as a currency for exchange and negotiation with Indigenous groups in a region where metal coins did not circulate regularly until the mid-eighteenth century.

Consequently, agricultural land use existed in the colonial Amazon, both in religious missions and in cities, which were affected by the consequences of such activity. In the more ancient colonial occupation region of the Portuguese Amazon, around Belém, there are fragments in the sources indicating that land use had caused damage to the soils. Some settlers complained that their land was already "*tired*" by years of exploitation. In 1723, for example, in a grant of land to Manuel Ferreira de Morais, the governor declared that the royal treasurer had examined the request of the settler. He stated that his lands "were tired because of the many crops of flour [cassava], cocoa, and tobacco that were grown there" (Arquivo Público do Estado do Pará, 1727, f. 174–174v). While it is true that this could also be a strategy for obtaining more land, there is no doubt that intensified cultivation affected the soils, partly because settlers' land was concentrated on the fertile banks of rivers.

In this sense, the expansion of cultivation did not seem to imply extending to the non-flooded parts of the forest (*terra firme*) but rather the progressive occupation of the lands near the banks of the rivers. Many settlers even asked for land on both banks of the same river, one tract facing the other. To a large extent, one might speculate that, despite the apparent abundance of land, there was not much soil available for cultivation, given the settlers' preference for margins. An interest that may have also to do with the reuse of lands fertilized for centuries by Indigenous peoples (*terras pretas*). In any case, fragments in the land grant letters indicate a saturation of the occupation.

Finally, livestock came to occupy an important place among the various types of land use in the colonial period. The scarcity of large mammals in the region caused

an apparent deficit in hunting and protein, which has occupied anthropologists and ethnohistorians in their debates on Indigenous populations' actions and development capacities (Ferguson 1989; Carneiro 2007). Faced with the same problem, the agents of the Iberian empires encouraged the introduction of livestock (cattle, goats, sheep) from the beginning, hoping that they would constitute a permanent source of food for the colonial population. However, the terrain was not the most appropriate, because of the lack of large areas of land and the presence of predators such as jaguars, among other reasons. To protect livestock, it was necessary to keep herds close to cities, but this caused clashes with agricultural land when they were invaded and trampled by livestock despite fences, as was the case in the village of São José do Macapá at the mouth of the Amazon.

In this context, livestock farming failed in many places, but in others (especially in the savannas or floodplains), succeeded and transformed the cultural patterns of the region. This was the case, for example, in places such as the Marajó archipelago or the Mojos plains and around the city of Santa Cruz de la Sierra, where cattle became the main economic asset but also a means of transportation, the basis of the regional diet and a symbol of cultural identity. In the second half of the eighteenth century, the bishop of Santa Cruz wrote that cattle "is the central and almost the only wealth of the country" since everyone depended on meat for food and tallow for lamps and soap making. However, the difficulty of preserving meat in the tropical climate required killing one animal per day, preserving a portion in salt (*tasajo*), and disposing of much of the rest (Archivo General de Indias, 1772).

Environmental Impacts

It has been shown here how, during the colonial period, the Amazon was a social space with intense agricultural, livestock, and extractive activities that transformed its landscape in a far-reaching process that preceded the arrival of Europeans and that, since the mid-nineteenth century, has entered a new phase due to the speed and scale of the consequent environmental transformation (Cleary 2001). These activities were precursors to new practices and problems that today pose real environmental threats, such as deforestation, the opening of pastureland, or illegal mining. However, during the colonial period discussed here, the main impacts were more related to the natural logics of the Amazon environment itself rather than to the scale of the activities.

Since the arrival of the first explorers at the beginning of the sixteenth century, the tropical climate of the Amazon had been recognized as a factor that would condition the chances of success of missionaries and conquerors. The scorching heat, accompanied by high humidity, caused the food to spoil quickly. However, not only fresh meat or fruit was deteriorated by heat; European objects, such as gunpowder

or steel, were also affected by moisture. The intense rain, seasonally in the lowlands and more commonly in the high jungle (*montaña*) that separated the Andes from the Amazonian riverbed, further complicated matters for Europeans. Floods have been a recurring problem since precolonial times, for which the Indigenous people had developed their solutions, such as burying food or building stilt houses, as the missionary Samuel Fritz observed (Fritz 1992).

Similarly, the floods were also a headache for colonial farmers. Portuguese land donation letters have some interesting information on the impact of flooding on crops. The term *alagadiço* (flooded terrain) appears recurrently in documents. However, sometimes, in a contradictory sense. In 1726, Estevão Geraldes Meireles, for example, complained in his petition that in the square league he had on the Guamá River (known as Guajará), he could not have "other culture than that of cocoa, as he had in it, because the land is *alagadiça* and it cannot produce food crops [*mantimentos*]." In 1731, Claudio Antonio de Almeida, though, said that his lands were "almost all flooded, which does not help the planting cocoa, cassava and other crops" (Arquivo Público do Estado do Pará, 1727, f. 7v-8; Arquivo Público do Estado do Pará, 1731, f. 47–47v).

Flooding also hampered the river communication that had become essential to the colonial Amazon because of the scarcity of land roads (permanently threatened by the surrounding nature) and the existence of large navigable rivers that facilitated human activity and movement, such as the Madeira River (Teixeira 2008; Melo 2022). Europeans developed a river culture in the colonial Amazon with fishing as its primary food supply and canoes as its main means of transport (Ferreira and Viana 2021). For this reason, colonial settlements were concentrated on the banks of major rivers, continuously dealing with the threat of potential flooding, as the overflows of rain and river often altered the profile of the banks, washing away ports, crops, and entire villages.

River communication was somewhat different on the edge of the jungle or the *montaña*, the transition zone between the Andean Mountain ranges and the Amazon, where the peoples of both regions had been meeting since long before the European conquests (Renard-Casevitz, Saignes, and Taylor 1988; Varese 2016). The Spanish raided the lowlands from the Andean highlands and faced a topography much more complicated than that known to the Portuguese. The rivers, with steep descents, rarely offered easy access and required the formation of alternative paths leading to painful crossings. The roads opened on the slopes of the last Andean foothills were precarious and temporary, also affected by rains, landslides, and even earthquakes and the eruptions of Andean volcanoes, as was the case with access roads to the Maynas missions (Cotrina 1996; Espinoza Soriano 2006). Moreover, Europeans and the Indigenous from the Andes who accompanied them were affected by changes in altitude and climate, and tropical diseases to which they were not accustomed.

This, precisely, was another problem that the colonial administrators of the Amazon had to suffer for centuries: tropical diseases with which they learned to coexist without ever knowing their causes and treatments. Amazonian diseases, on the other hand, had fewer consequences on human history in the region compared with diseases brought from the Old World (involuntarily) by Europeans, their livestock, and their African enslaved. These diseases, enhanced by policies of human concentration in missions and villages, devastated Indigenous populations (Denevan 1992b; Santos Granero 1992; Hemming 2009; Livi Bacci 2016; Vieira Junior 2021). To try to mitigate the effects of these recurrent epidemics, the Iberians tried different solutions, such as experimentation with the first "vaccines" against smallpox, both in the missions of the Portuguese Amazon and in the Jesuit missions of Maynas (La Condamine 1745; Espinoza Soriano 2006). Insects, especially mosquitoes, were the main transmitters of local diseases. Nevertheless, they also had other impacts on people's lives, both materially and psychologically. Ants and all kinds of insects ruined food and crops, complicating land use. Therefore, care was taken to avoid the most infested areas and to relocate crops when affected. In several land petitions, Portuguese settlers complained of "*formigueiros*" (anthills) that hindered the cultivation of the land. Finally, it should be noted that not only insects conditioned human activity; other animals of Amazonian fauna also put the existence of colonial crops and livestock at risk. Predators such as jaguars attacked herds and threatened roads.

Conclusions

The main impact of the arrival of Europeans in the Amazon region was, therefore, demographic. Wars, enslavement, and diseases brought by Europeans severely impacted the various Indigenous communities. As for the multiple types of economic exploitation developed during the colonial period, they had various consequences. Some forms of economic activity threatened plant species, such as the *cravo do Maranhão*, the sarsaparilla, and various types of woods (cutting increased markedly in the second half of the eighteenth century), whose exploitation inevitably meant the disappearance of trees and roots. Also, animals were affected, for example, the manatee (*peixe boi*, in Portuguese) and amphibians, such as turtles, widely sought after for domestic consumption.

The development of agricultural activities, however, by all indications, mainly affected the fertile lands near the riverbanks. These spaces saw an increase in the concentration of certain previously non-existent crops, such as cocoa, since they were located near the cities and colonial towns, areas of older occupation, which suffered a more significant impact. Still, the consequences of European colonialism (until the beginning of the nineteenth century) in the vast spaces of the so-called main-

land, between the channels of the main rivers, remain a subject that deserves attention from historians. All seems to indicate that the expansion of economic activities had a less significant environmental impact on these areas (unless demographic, as stated). As for livestock, large herds were located in specific regions of the Amazon, mainly the savannas (*campinas* in Portuguese).

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