

# Defining the Anthropocene tropical forest: Moving beyond ‘disturbance’ and ‘landscape domestication’ with concepts from African worldviews

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## Abstract

How natural and cultural forces shaping tropical forested landscapes are conceptualised is of vital importance to Anthropocene debates. We examine two concepts: disturbance and landscape domestication. From the perspective of disturbance, humans – whether ancient or modern – are a priori negative for tropical forests, outside of and alien to nature. From this view, the Anthropocene is a planetary scale aggregation of disturbance. A more just vision of tropical forests, accepting anthropogenic influence on biodiversity, would combine ‘disturbance’ with other concepts that capture human agency and intentionality. Landscape domestication proposes that humans can shape ecology and plant and animal population demographics, making the landscape more productive and congenial for humans, upgrading or degrading the biodiversity of tropical forests. Herein, forest peoples shape the Anthropocene itself through their ‘domestication’ of the forest. Yet this approach can overdetermine culture, ignoring non-human agency, whilst human impacts can be seen as the outcome of intentional modifications to increase landscape productivity, at worst a disavowed projection of ‘economic man’. Using the convivial scholarship framework of Nyamnjoh, we argue that these ideas give incomplete views of tropical forests in the Anthropocene and can be enriched by concepts derived from African worldviews with ‘relationality’ and ‘wholeness’ at their core. These are expressed in *ohanife*, deriving from Igbo

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language, *ubuntu*, from the Nguni language and *ukama*, a notion from Shona culture. Together these concepts evince an ‘eco-bio-communitarianism’ embracing humans, God, spirits, ancestors, animals and inanimate beings in a ‘community of beings’ irreducible to the culture-nature divide (moving beyond disturbance) and allowing for the agency and personhood of non-humans (moving beyond historical ecology). This is consonant with Indigenous Amazonian worldviews, such as that of Kopenawa. Approaching human-nature relations from Nyamnjoh’s idea of conviviality, we elaborate a less incomplete and more just perspective on the cultural and natural shaping of Anthropocene tropical forests.

### Keywords

conservation, conviviality, historical ecology, ohanife, ubuntu, ukama

## Introduction

How should the relationship between humans and tropical forests in the Anthropocene be conceptualised? The now widespread use of the Anthropocene concept, along with alternatives such as the Capitalocene or Plantationocene (Davis et al., 2019; Ellis, 2018; Ferdinand, 2022; Moore, 2016) provoke a reappraisal of older debates on how to theorise the interplay of culture and nature in shaping tropical forest landscapes. Two ideas have remained central in theorising human effects on tropical forest landscapes both before and after the proliferation of Anthropocene concept(s): ‘disturbance’ and ‘landscape domestication’.<sup>1</sup> From the perspective of disturbance, humans – whether ancient or modern – are generally viewed as an a priori negative force on tropical forests (Peres et al., 2006). By definition, humans are seen to be outside of and alien to nature.<sup>2</sup> From this view, the Anthropocene is a culmination of the disturbance perspective at the planetary scale. In such an Anthropocene, human impact on nature (in this case, tropical forests, which are axiomatically separate from the humans that inhabit them) can only be destructive. Following this logic, tropical forests are outside of, and threatened by, the Anthropocene (c.f. Edwards et al., 2019; Flores and Staal, 2022; Malhi et al., 2014). From the perspective of landscape domestication, conversely, humans shape the ecology, and plant and animal population demographics, resulting in ‘a landscape more productive and congenial for humans’ (Clement, 2014). From this view humans can both upgrade or degrade tropical forest landscapes with regard to biodiversity (Balee, 2006). Herein, tropical forests are key areas where ancient and modern forest peoples shape the Anthropocene itself through their ‘domestication’ of the forest (Roosevelt, 2013; WinklerPrins and Levis, 2021).

Yet, despite their seeming opposition, both of these concepts emanate from the Western academy and, as such, can be seen as part of the ‘colonial discourse of the Anthropocene’ (Simpson, 2020, see also Davis and Todd, 2017), often both sharing its underlying positivism (Kincheloe and Tobin, 2009; Steinmetz, 2005). In order to decolonise research in tropical forests while critically engaging with the Anthropocene, we argue that it is necessary to draw the question of how culture and nature interact in shaping tropical forests into dialogue with the knowledges and ontologies originating in the ‘Global South’, in particular those from tropical forest peoples themselves (Fletcher et al., 2021; Malo Larrea et al., 2024). Our argument is that the concepts used to understand human impacts on tropical forests are part of what Quijano (2007) describes as the coloniality of modernity/rationality, and these concepts occupied the core of colonial metropolises whose violent economies of extractivism expanding throughout the global periphery ultimately

created the Anthropocene (de la Cadena and Blaser, 2018; Ferdinand, 2022). Therefore, resisting (or undoing) the Anthropocene in tropical forests and the allied task of decolonising tropical forest research requires a critical interrogation of the notions of disturbance and landscape domestication.

The beginning of the Anthropocene is contested, and this has implications for our discussion here. Candidates include the Early Anthropocene, the onset of farming (dates include 5000 & 8000 ybp), the 1500 Columbian-exchange, the 18C Thermo-Industrial Revolution, or the post 1945 Great Acceleration (Gibbard et al., 2022). We find the post-1500 colonisation of the Americas the most compelling beginning for the Anthropocene (Lewis and Maslin, 2015) which also aligns it more closely with beginnings of the Capitalocene (Moore, 2016) and the Plantationocene (Ferdinand, 2022; Haraway, 2015). From this standpoint, the Anthropocene is inherently associated with colonialism and the imposition of European-Western knowledge as cultural universals in the colonies. As such, the further unfolding of the Anthropocene is also symbolic not just material (Ellis et al., 2013; Roberts et al., 2018, 2021). Scientific disciplines, including ecology, anthropology and archaeology, representing both sides of this disturbance landscape domestication debate not only benefitted from early colonial expeditions (Blanc, 2022; Trisos et al., 2021); colonies were key sites for the development, experimentation and circulation of foundational ecological, anthropological and archaeological concepts and practices (Baker et al., 2019; Fairhead and Leach, 2000; Grove, 1996; Tilley, 2011). Indeed, these Western knowledges historically informed colonial forest and land-use laws and policies (Fairhead and Leach, 2000), the legacies of which are persistent across post-colonial and contemporary conservation practices and agendas (Chaudhury and Colla, 2021; Kashwan et al., 2021). Sungusia et al. (2020) highlight how the scientific forestry taught in educational institutions in both the North and South is a legacy of colonialism that obscures other kinds of forestry, namely those of Indigenous and local forest peoples. Their knowledges can help in resisting further spread of the Anthropocene, or resisting the coloniality of modernity/rationality that it represents (Quijano, 2007). So, in conceptualising tropical forests, this knowledge needs to be brought into dialogue with approaches to human impacts on tropical forests in the Anthropocene, namely disturbance and landscape domestication.

We argue that ‘disturbance’ (foundational to ecology, see Bush et al., 2015), and ‘landscape domestication’ (a concept associated with historical ecology, see Clement et al., 2015), whilst bringing important insights, yield an incomplete understanding of tropical forests in the Anthropocene. Moreover, both concepts are typically embedded in Western scientific institutions (i.e. research institutes, universities) of scientific forestry and conservation. Both are part of the (neo-)colonial knowledge of the Western academy (Chilisa, 2017; Mawere, 2014; Sungusia et al., 2020). To be sure, a number of other perspectives have emerged seeking to integrate humans and nature in principle and in practice, for instance, environmental stewardship (Bennett et al., 2018), ecosystem management (Grumbine, 1994), and biocultural diversity (Elands et al., 2019). Yet, these approaches do not always transcend the human – nature divide, and the dominant ‘disturbance’ thinking (Brosius and Hitchner, 2010; Elands et al., 2019).<sup>3</sup> Indeed, ‘disturbance’ and ‘landscape domestication’ have continued to underpin persistent, exclusionary conservation policies which continue under new global agendas (Kashwan et al., 2021). Both would benefit from dialogue with concepts associated with ‘other’ knowledges, in particular those of forest peoples who have their own understandings of how people have shaped tropical forests both today and historically. Indeed, an ethical response confronting the Anthropocene as a catastrophe of industrial civilisation can only include ‘other’ epistemologies and ontologies, and indeed this is the only way to trouble and undo the coloniality of Anthropocene modernity/rationality (Quijano, 2007) that inheres in the concepts of ‘disturbance’ and ‘landscape domestication’.

In this paper we seek to reveal and reduce the incompleteness of these concepts, drawing on the work of anthropologist Nyamnjoh (2017), who suggests that much scientific work has a colonial foundation which continues to marginalise or deny other ways of thinking, including those of African provenance. He notes that the scientific tendency to present one's research as a complete understanding of an issue is problematic. Referring to the literary work of Amos Tutuola (a Nigerian writer) based on the Yoruba worldview, he demonstrates that one can improve one's understanding of a situation by drawing from the best thinking of multiple disciplines, across academic and local knowledge, from the North and the South. Although knowledge can never be complete, a 'convivial scholarship' approach, Nyamnjoh argues, offers a better understanding of the world as it centres a way of thinking which explicitly connects multiple traditions, and which may cross the lines frequently presented in Western scholarship (e.g. nature-culture; pristine-disturbed; ontology-epistemology). Reflecting this way of thinking, popular African thinking often has a view of 'in-betweenness', straddling the natural and supernatural, the past and the present. With a convivial scholarship approach, Nyamnjoh argues that scholarship can be invigorated with new directions. These directions, he argues, are most accessible to 'frontier beings', who are at the crossroads of different ways of thinking and knowing, able to draw from them simultaneously.

According to environmental philosophers, 'relationality' and 'wholeness' are at the core of African cosmologies (Behrens, 2014; Ikeke, 2015; Kelbessa, 2018); These ideas are expressed in the notions of *ohanife*, deriving from the Igbo language, *ubuntu*, a word from the Nguni language and *ukama*, a notion situated in the Shona culture. Together these concepts express an eco-bio-communitarianism gathering together humans, God, spirits, ancestors, animals, and inanimate beings in a 'community of beings' irreducible to the culture-nature divide (moving beyond disturbance) and allowing for the agency and personhood of non-humans (moving beyond historical ecology). This is broadly consonant with Amazonian Indigenous worldviews, such as those articulated by Kopenawa (2013), as we discuss below.

An engagement with Nyamnjoh's work, particularly his notions of convivial scholarship and in-betweenness, is timely given the ongoing decolonial discussions about recognising non-Western knowledges by a growing range of disciplines (Franco-Moraes et al., 2021; Hernandez and Spencer, 2020; Martinez, 2018; Murphy, 2011; Reyes-García et al., 2019; Todd, 2016) including conservation (Skandrani, 2018) and ecosystem science (Pascual et al., 2023). We argue that future thinking about tropical forests in the Anthropocene should reflect an intercultural dialogue between different traditions of knowledge. In this paper we offer some insights into what such a dialogue might entail by curating diverse perspectives for understanding tropical forest landscapes, engaging with Amazonia and Africa in particular. These perspectives strikingly underscore the singularity and limits of the dominant concepts of disturbance and landscape domestication, while constituting a broader 'ecology of knowledge' from which to imagine and create convivial epistemologies of Anthropocene tropical landscapes.

The paper is structured as follows. In section two we outline our critiques of 'disturbance', section three focuses on 'landscape domestication', drawing examples from Amazonia since this is the research arena where the debates between proponents of these two concepts have occurred. Section four outlines Nyamnjoh's convivial framework in order to present perspectives from Africa to complement disturbance and landscape domestication thinking. The paper then uses the example of sacred forests to reveal diverging understandings of these cultural and natural spaces from the disturbance, landscape domestication and African perspectives, respectively. Section five presents our concluding discussion.

## Disturbance

Disturbance is a foundational concept in ecology. A commonly cited definition is ‘any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment’ (Pickett and White, 1985: 7). In scientific forestry, disturbance is defined as ‘a cause, a physical force, agent, or process, either abiotic or biotic, causing a perturbation (which includes stress) in an ecological component or system; relative to a specified reference state and system; defined by specific characteristics’ (Rykiel, 1985: 364). As can be seen from these definitions, the disturbing agent is seen as external to the ‘ecological component or system’, itself understood as having a particular baseline ‘reference system or state’, into which the agent intervenes. According to Battisti et al. (2016: v), the ‘anthropogenic processes that interfere with the structure and dynamics of the components and the environmental systems’ are threats, which are specifically human-induced events. The idea of disturbance sees anthropogenic influences as negative (degrading) to nature, and exterior (separate) to it. Classic ecological examples include fires, flooding, and clear-cutting. Ecologists also distinguish between ‘natural’ (e.g. a naturally occurring fire often caused by lightning) as opposed to ‘anthropogenic’ (e.g. a fire set by people) disturbance. In this paper, we focus on anthropogenic disturbance, which is frequently used to refer negatively to human impacts on forests with no critical discussion of the concept, with the human being seen as an *a priori* negative for nature (e.g. Martínez-Ramos et al., 2016; Moreno-Mateos et al., 2017).

The notion of disturbance is problematic because it doesn’t consider the ‘why’ questions of what people do in forests (e.g. politics, warfare, settlement, agriculture), all of which are necessary to understand the impact of past societies (Ellis et al., 2021), as indicated by anthropogenic soils and concentrations of useful species in tropical forest landscapes (Fraser et al., 2014). From the above definition we can understand disturbance as the interruption of a particular condition. However, when applied to tropical forests this has at least two harmful effects: firstly, we often don’t know why there was an ‘interruption’ (why did the disturbance happen?), and secondly the ‘interruption’ (in this case, anthropogenic disturbance) is seen as outside of and separate from the forest which is being interrupted. On a conceptual level, this thinking is related to a separation of culture and nature that has shaped European thought from the Greeks through the Enlightenment to modern science, and has characterised European colonial thinking (Acker et al., 2016; Arnold, 1996).

Disturbance posits an original state (i.e. climax) (Clements, 1936) which humans can only affect negatively. Palaeoecology has demolished the idea of an original state in favour of the *longue-durée*: the appearance and abundance of heliophilic species in fossil pollen spectra are generally used as an indication of past human impacts on forest cover. Interpretation of pollen spectra shows that over the last five millennia the African Guinean-Congolian rainforest has undergone two major phases of regression, characterised by the expansion of secondary formations at the expense of mature forests (Ngomanda et al., 2005, 2007; Vincens et al., 1999). In the context of biodiversity, one hypothesis states, for example, that the current presence in the overstorey of mature tropical forests of heliophilous species that are unable to regenerate is linked to past anthropogenic impacts (mainly shifting cultivation) (van Gernerden et al., 2003), with the current forest bearing the legacy of the past (Morin-Rivat et al., 2017). This suggests the importance of anthropogenic factors in the maintenance of certain species abundance. Nonetheless, the theory of original climax vegetation climax vegetation has long been shown to be erroneous – because even without humans, ecological systems are constantly in dynamic and non-linear flux (Botkin, 1990).

Conceiving of humans as being outside of nature fundamentally misrepresents forest peoples and misrecognises their cultures. The nature:culture binary is frequently alien to forest peoples’

knowledge systems. Claude Levi-Strauss (2021) and Philippe Descola (1994) revealed the Manichean culture:nature binary as central to the globalisation of Western thought (see Kialo, 2007). However, if we aim to have a more just vision of tropical forests, and accept anthropogenic influence on biodiversity, then it becomes impossible to exclusively use the term ‘disturbance’ without combining it with other concepts that capture human agency and intentionality.

While the ‘intermediate disturbance hypothesis’ posits that some disturbance can be positive for local species diversity (Osman, 2015), so opening the door to the possibility that people can be beneficial to nature, it does not offer a conceptual alternative to disturbance, and so can only refer to an external human intervention (e.g. separate and outside of nature) being inadvertently, rather than purposefully or intentionally, beneficial to biodiversity. The term ‘human-modified’, which is used by some ecologists, does have the potential to offer a more useful alternative to disturbance, since ‘modified’ does imply intentionality. Yet in the widely cited paper which introduces the term (Gardner et al., 2009), it is used interchangeably with disturbance, without the authors addressing or even acknowledging the potential contradictions of the two terms (i.e. disturbance implies unintentional impacts by an external humanity, whereas ‘modified’ could capture intentionality). In conflating these two terms, the potential to use the term ‘modified’ together with ‘disturbance’ to overcome some of the limitations of the latter is foreclosed. For example, a shifting cultivation field in a forest is clearly an intentional modification, but the opportunities it provides for successional species once the field is fallowed are not and could be understood as intermediate disturbance if overall biodiversity increases.

Attempts to disaggregate disturbance can also trap us in depicting humans as having only negative effects on tropical forest biodiversity. Peres et al.’s (2006) disaggregation of different kinds of disturbance provides greater descriptive precision for ecologists, and is logical within its own terms of reference. While the authors’ category of ‘highly detectable disturbance’ (i.e. industrial deforestation, dams, roads and mining) is unarguably negative from the viewpoint of tropical forest conservation, whether or not their other categories of ‘marginally detectable’ and ‘almost undetectable’ disturbance are overwhelmingly negative can be called into question. This is because they understand even benign activities like collection of non-timber forest products as threats (2006: Table 1). The authors even propose a new concept, ‘cryptic disturbance’, to address these unknowns. The concept of disturbance, even disaggregated in this way, is unable to grasp conceptually that ways of life that have existed in the region for millennia like non-timber forest product collection, subsistence hunting and the use of fire might not be threats to the tropical forest but rather have shaped its current biodiversity in ways that are positive for species diversity and human wellbeing.

The issue with ideas of ‘marginally detectable’ and ‘almost undetectable’ disturbance is the way that the huge impacts of industrial civilisation (i.e. mega-dams) are lumped together into the same concept of disturbance which is also used to describe the impacts of the livelihood of forest peoples; one example given in the Peres et al. (2006) paper is ‘old shifting cultivation fields’. In this way, the large-scale industrial impacts are conflated with the ways of life of the very forest peoples who are often the best stewards of the forest (see Ramos et al., 2021; Zanjani et al. 2023); the impacts of these forest peoples are conceived solely and negatively as agents of disturbance. Such a perspective where all forms of human impact are glossed as disturbance can be used to support a version of fortress conservation, which calls for conservation interventions such as strict protected areas, to separate human disturbance from the natural world (Brockington, 2002; Büscher et al., 2017; Wilson, 2017), rather than disentangling benign or ‘positive’ impacts by some forest peoples from destructive impacts of megadams.

In discussions on pre-Columbian Amazonia meanwhile, the positions taken by different researchers on the extent to which current forests bear the legacies of the actions of pre-Columbian

Native Amazonians can be ranged along a continuum. One extreme is what was once called the ‘pristine forest’ position, where people in the pre-Columbian period were thought to have had limited impacts on the forest (Meggers, 1971). Nowadays, few ecologists would support this position. But whilst they acknowledge significant pre-Columbian impacts, they continue to theorise them as ‘disturbance’ (see Barlow et al., 2012). But the issue with glossing all human impacts as disturbance in the pre-Columbian period is the same as that of the present: it dehumanises Amazonian peoples by stripping them of the capacity to purposefully shape environments.

Attempts to address these problems by some ecologists thus far are inadequate. For example, Grimm et al. (2017: 1) note that ‘the issue of conflating [the] urban with disturbance becomes clear when one adopts a view of cities as ecosystems. . . since people themselves are part of and creators of the system. . .’ This implies that people are not ‘part of and creators of the system’ outside of urban spaces and sets up a theoretically untenable opposition between non-urban areas, where people can only disturb the environment, and urban areas where people are part of it and create it.

## Landscape domestication

The opposing proposition to disturbance that we explore in this paper is ‘landscape domestication’, supported by historical ecologists, and some archaeologists (e.g. Levis et al., 2018; Terrell et al., 2003). As noted above, in Amazonia, scholars working with the concept of disturbance today accept significant pre-Columbian impacts: almost no one working within this paradigm supports the idea of a pristine forest anymore. The substantive differences between the two positions today then turn on (i) *the question of scale*: proponents of landscape domestication think pre-Columbian impacts on forests and soils were more extensive than those who talk about disturbance, compare e.g. Clement et al. (2015) with Bush et al. (2015) and (ii) *intentionality*: are such impacts on the forest just ‘disturbance’, or are they the outcome of conscious design? This question is basically ignored by those working with disturbance, and is answered by way of either (a) *cultural determinism* or (b) *niche construction* by some proponents of the domesticated landscape.

In a recent iteration of the most frequently cited definition, landscape domestication is ‘A cultural process during which human intervention in the landscape and manipulation of landscape components cause changes in landscape ecology and in the demographics of its plant and animal populations, resulting in a landscape more productive and congenial for humans’ (Clement, 2014). The idea of the domesticated landscape, associated with historical ecology, argues that people can both improve or degrade tropical forest landscapes from the perspective of biodiversity (Balee, 2006). Such an approach conceptually privileges people’s ability to change forest ecosystems over that of biophysical factors. Proponents of landscape domestication have engaged in debates with ecologists over the extent to which Amazonia is anthropogenic or pristine (Bush et al., 2015; Clement et al., 2015). Among historical ecologists thinking about landscape domestication, there are two approaches: a culturalist approach and a niche construction approach. We now deal with these in turn.

Archaeologist Clark Erickson claims Native Amazonians ‘created the world that they wanted through human creativity, technology and engineering, and cultural institutions’ (Erickson, 2003:456). Together with anthropologist William Balée, he writes ‘Historical ecologists support a version of cultural determinism’ (Balée and Erickson, 2006:5). In this way, ‘ADE [Amazonian Dark Earth] formation, which involves careful production of biochar and management of soil micro-organisms, is *intentional soil engineering*’. (Erickson, 2008:171, our emphasis). There is merit in this culturalist approach. In particular, it moves beyond a simplistic culture-nature separation that characterises the discipline of ecology and the concept of disturbance. It also affords people the possibility for purposeful action and intentional to change the forest. Yet to gloss all

ADE as ‘intentional soil engineering’ is to obscure that much of its formation may be the inevitable outcome of patterned waste disposal practices around the edges of settlements rather than practices designed to improve soils in agricultural fields (Fraser et al., 2014). As Arroyo Kalin (2015:11) notes, ‘all carefully documented archaeological cases of *terras pretas* evidence these were not purpose-built agricultural soils but rather anthrosols formed on substrates produced by former settlement activity’.

There are also conceptual issues with the idea that ‘domesticated landscapes’ are intentional. Human agency and intentionality inhere in acts of cultivation that end up leading to domestication, including selection of landraces and propagation of specific phenotypes. But it is unlikely that Holocene humans predicted that domestication or the evolutionary process would occur when they engaged in farming. Moreover, unconscious selection arising from domesticated populations living in an environment of human cultivation, herding, care, harvesting, and processing, also plays a strong role in domesticated evolution. The current consensus is that domestication is brought about by both conscious and unconscious selection, the latter more like natural selection. Conscious intentionality, while important, ‘may not be all-encompassing’ (see Purugganan, 2022).

Seeing different forms of landscape domestication as intentional can therefore over-determine culture, ignoring the agency of nature. This is evident in the widespread use of the term ‘anthropogenic forests’ to describe locales where there is a concentration of useful species. Even if some species are the result of past human management, many species in any given *locale* are not. So, to describe the whole space as ‘anthropogenic’ exaggerates culture while downplaying nature. Indeed, nature is seen as a blank slate for the projection of unlimited human agency and creativity. But Nature does things. Rivers, trees, animals, geological processes and the climate act in unpredictable and unexpected ways (Clark, 2011). And in many Indigenous worldviews, this is not surprising because rivers, trees, animals and even mountains can be persons.

More recently, scholars in historical ecology have begun to employ Niche Construction Theory. From this perspective, humans are seen as ecosystem engineers, creating ‘anthromes’ (see Ellis and Ramankutty, 2008) including in Amazonia, Dark Earths and ‘anthropogenic’ forests. Niche construction theory, unlike the culturalist approach, is therefore compatible with the biological concept of domestication. But for both culturalist and the niche construction approaches, ‘domesticated landscapes’ are seen as the outcome of modifications to increase productivity. This raises the possibility that each is a disavowed or unconscious projection of Western ‘economic man’, *Homo economicus*, an individual maximising their utility (see Ingold, 2000: Chapter 1–3). From this viewpoint, Indigenous knowledge exists, in part, for the purpose of rational resource management. As Clement et al. (2020: 41, our emphasis) state ‘each of these peoples has its *own traditional ecological knowledge about niche construction*’. But ‘traditional ecological knowledge’ is not only ‘about’ ‘niche construction’. This statement is incomplete because it reduces Native Amazonian knowledges and practices to those that serve to make the landscapes that they inhabit more productive and congenial. So, the argument becomes circular: X human impact improves the environment, therefore it must have been intended to do so. The idea that people domesticated large portions of their landscape only to make them more ‘productive and congenial’ as per Clement’s definition above is a reductionist stance reducing complex interactions with forests to that of a modern, western utilitarian subject interested in maximising production.

For instance, in the Colombian Amazon, close to the town of Leticia, Tikuna Indigenous people are well aware of the agricultural potential of the *terra preta* soils that occur in the landscapes they inhabit. But they do not farm these soils. When asked why, they explain it is because the *terras pretas* are ‘not theirs’. They are ‘soils of the ancestors’, made by people in the past; on sites subsequently abandoned by their former inhabitants. They respect and do not visit these places, which



they see as ‘spiritual property’. Because of their deep respect for the ancestors, things belonging to those ancestors (like *terra preta*) cannot be appropriated today (Torres and Cuartas, 2013). This is broadly similar to the norms protecting sacred forests generally across sub-Saharan Africa, as we will see later. For many Indigenous Amazonians, such as the Yanomami, and indeed many African societies, tropical forests are not ‘anthropogenic’ or ‘domesticated’ nor ‘the culturally constructed niche of humanity’ but are saturated with non-human persons, including spirits and ancestors, with whom one must negotiate when interacting with it (i.e. cutting a tree or killing game) (Kopenawa, 2013; see also Kohn, 2013). Returning to the argument of Clement et al., we can ask just how is this Indigenous knowledge ‘about’ niche construction?

Evidence from research in Africa also shows how cultural influences on biodiversity and landscapes can be the outcome of settlement patterns, politics, warfare, sacred areas, the demands of the ancestors, and so not only the outcome of ‘Indigenous knowledge’ and its intentional or fortuitous improvements productivity, per se (Fraser et al., 2014, 2015; Hymas et al., 2021). How can we move beyond the stale impasses of the disturbance versus landscape domestication debate? We now turn to this question.

## Theorising beyond the West: African perspectives

Historical ecology in and on tropical Africa has not yet flourished as it has in Amazonia: the number of studies is quite limited. Following a few isolated works dating back to the 1990s and 2000s (Gariné et al., 2003; Schmidt, 1994; Yasuoka, 2009), historical ecology emerged during the 2010s (Boles et al., 2019; Davies, 2010; Ichikawa, 2012; Lane, 2010; Pawlowicz et al., 2014; Salpeteur, 2010, 2018; de Saulieu et al., 2018; de Saulieu et al., 2016; Walters, 2012; Yasuoka, 2013, 2015). However, studies in the fields of environmental anthropology, ethnoecology and environmental history are considered by some authors (de Saulieu et al., 2018) as precursors of historical ecology on tropical Africa (Carrière, 2003; Fairhead and Leach, 1996; Juhé-Beaulaton, 1995, 1998; Juhé-Beaulaton and Roussel, 1998). Although historical ecology and related disciplines often depend on local knowledge, its theoretical frameworks are rooted in Western approaches, a tendency which Geralda and Junqueira (2021) suggest should be greatly reduced. As historical ecology is still an emerging field of research in and on Africa, it is an opportunity to be creative and go beyond the limits identified above and to enrich the approach with concepts and perspectives based on a dialogue with other ways of thinking and representing the human-environment relations from the continent.

The previous two sections have shown how ‘disturbance’ and ‘landscape domestication’ reproduce worldviews about tropical forests rooted in the Western Academy. Although these are ideas generally accepted by many ecologists and historical ecologists, we submit that both concepts provide an incomplete view of forest landscapes. The illusion of completeness is sustained when scholars draw from a limited, but highly accepted form of scholarship, accepting it as universal (Nyamnjoh, 2017). Referring to Tutuola’s writings, and celebrating incompleteness as the normal order of things, Nyamnjoh’s framework suggests that recognising incompleteness of knowledge is an exciting opportunity for scholars to seek creative ways to better understand the complexity of the world. Nyamnjoh encourages a ‘meaningful dialogue’ between and within disciplines, between ‘modern science’ and local knowledge (2017: 54) to foster a more inclusive way of conducting research (2017: 62). Similar to how Amos Tutuola’s literary creatures, drawn from Yoruba beliefs, are incomplete beings that become complete only when drawing the best parts from others, scholarship could enrich its understanding of tropical forests, through dialoguing across perspectives, theories and knowledges (e.g. Nyamnjoh (2015, 2017)). He proposes that scientific advances could have a more holistic approach by bringing together scholarship from the global North and the

South. Nyamnjoh (2017) offers a convivial framework whereby we can consider the multiplicity of perspectives and notions of forests and landscapes, including those that move beyond dualisms of nature and culture, to embrace the place of people in relation to forests, plants, animals, earth, from the past to the future, from the natural to the supernatural. Recognition of our incomplete knowledge is a crucial step to advance knowledge-making together (Nyamnjoh, 2020).

As shown in the previous sections, to see forests as either being disturbed or domesticated is an incomplete view, based largely on Western concepts from ecology and historical ecology. To propose a way out of the limited debate on disturbance versus landscape domestication, we draw on the concepts discussed by scholars in the field of environmental philosophy, drawn from African worldviews (Kelbessa, 2022). We suggest that *ohanife*, deriving from words in the Igbo language (Chimakonam, 2017), *ubuntu*, a word from the Nguni language (Chibvongodze, 2016; Etieyibo, 2017; LenkaBula, 2008) and *ukama*, a notion situated in the Shona culture (Murove, 2004, 2009) could be useful for engaging in a reflection on how humans and forests are conceived within African contexts. Moreover, the relational ethics, such as between the past, present and future, embedded in these worldviews (Behrens, 2014; Ikeke, 2015; Kelbessa, 2018) can inform environmental management practices, going beyond the utilitarian or productivist Western view of relations between humans and nature. Writings about these three concepts focus more on how they can be mobilised to (re)activate historically and culturally grounded environmental ethics (Murove, 2004) and meaningful conservation practices (Mawere, 2014), and address both social and environmental justice (Le Grange, 2012; LenkaBula, 2008). However, they can also contribute to a broader reflexion on how we conceptualise landscapes and interactions between humans and nature.

The concept of *ohanife*, proposed by Chimakonam (2017), derives from two words in Igbo (a language from south-eastern Nigeria): *Oha* and *Ife*. *Oha* refers to humans, usually a community of people, and *Ife* means things or non-humans, including both non-human beings (e.g. plants, animals) and non-living or inanimate things. *Ohanife*, as an Igbo synonym of ecosystem, means 'a network or community of humans and non-humans'. The concept is nourished by the idea of 'relationship', embedded in the Igbo notion of *ezi n'ulo*, but also common in many places in Sub-Saharan Africa (Chimakonam, 2017). According to Chimakonam (2017), the notion of *ezi n'ulo*, and more specifically the *ezi n'ulo* architecture, expresses the interactions between environments of humans and non-humans. Grounded in this notion, *Ohanife* expresses the relationship of interdependence and complementarity of all existing things (whether human or non-human, animate or inanimate) within a common home. This idea of relationality of all existing things is also embedded for instance, in the notion of *ubuntu*.

Whereas writings in philosophy and social sciences about *ubuntu* mainly focus on human relationships and questions of humanness, some argue that most of the discussions are too anthropocentric (LenkaBula, 2008). The notion of *ubuntu*, a Nguni word, is commonly used in South Africa and is understood through proverbs, like *umuntu ngumuntu ngabantu* (in the Nguni language), roughly translated into English as 'a human being is a human being because of [its relation with] other human beings' (Letseka, 2012: 48). The idea that the humanness of each individual results from relationships with other human beings, is embedded in the concept of *ubuntu*. However, LenkaBula (2008) and Chibvongodze (2016) argue that *ubuntu* is not only about human; *ubuntu* or *botho* (in the Sotho language) expresses also the interconnectedness of humans, with the earth and other non-humans like plants or animals. Humanness needs to be understood as an expression of interconnectedness between individuals (humans), the society and the biophysical world; according to Le Grange (2012) and Murove (2004), *ubuntu* is a concrete expression of *ukama*.

The notion of *ukama*, coming from the Shona culture (Zimbabwe), refers to the interrelatedness between people within the community, including the living and the non-living (ancestors and

unborn), other spirits and the non-human biophysical world (Le Grange, 2012; Murove, 2004, 2009). Similar worldviews are shared across the continent; for instance, the Oromo people from Ethiopia (Kelbessa, 2018: 316) view 'human beings as an equal part of a vibrant interconnected whole. They see themselves as within nature, not as subjects detached from it'. In the western highlands of Cameroon, the worldview of the Nso' people, is 'first and foremost, communitarian' (Tangwa, 1996: 192). According to Tangwa, this eco-bio-communitarianism goes beyond human communitarianism, but also encompasses, animals, plants, the earth, spirits and ancestors.

Several authors also draw attention to the ethical dimension associated to these belief systems. Murove (2004) depicts them as an 'ethic of the interdependence' of humans within the society to which they belong (including the living, the dead and the unborn) and to the environment on which they all depend. In particular, central to numerous African worldviews, is the relationship between the living, the ancestors and the unborn, which implies intergenerational responsibilities and duties, leading for instance to specific environmental practices. *Ukama* expresses well these entanglements between past, present and future generations (Murove, 2007). Wiredu (1994: 46) wrote, 'of all the duties owed to the ancestors none is more imperious than that of husbanding the resources of the land so as to leave it in good shape for posterity. [ . . . ] The upshot is that there is a two-sided concept of stewardship in the management of the environment involving obligations to both ancestors and descendants which motivates environmental carefulness, all things being equal'.

The environmental ethics of African worldviews, in particular the idea of reciprocity and duties towards the environment, is highlighted by Behrens (2014), Ikeke (2015), LenkaBula (2008), Le Grange (2012) and Murove (2004). Nyamnjoh (2020b) uses an eating metaphor to capture the idea of reciprocity that informs humans-environment relations in the Grassfields of Cameroon: 'not only we [humans] are expected to eat in order to survive, to sustain ourselves and to be able to fulfil our ambitions, but we are expected as well to make it possible for others to eat in order for us to keep eating'. By 'others' Nyamnjoh refers to fellow humans & the plants and animals in the environment from which people draw for sustenance and says that 'you[humans] have to spend time in the wider environment, take whether vegetation or animals, grooming them, growing them, offering them an environment to reproduce themselves, so you can continue to benefit from them'. Thus, following the above perspectives, the practices of humans in the environment could be informed by ethics of stewardship and duties, either directly towards the environment or duties to ancestors/unborn mediated by practices on plants, animals or the land, thus not necessarily by a strict utilitarian view in order to increase productivity per se.

One could argue that this conceptualisation of human-environment relations is still anthropocentric and seemingly utilitarian, stressing that the ideas of interdependency and reciprocity between humans and the environment are grounded in human interests and needs, echoing the culturalist approach of landscape domestication. Bassey and Pimaro (2019: 129), discussing the worldview of Igbo culture from Nigeria, argue that even though humans occupy a central position in African cosmologies, it is not anthropocentrism but 'anthropoholism because, despite man's central role (Anthropo), man is just a part of the (whole) environment, as such cannot exist outside the environment, and cannot be understood without allusion to the environment (Holism)'.

Returning to our central concern about landscapes and forest history, the ideas of relationality and wholeness associated with African worldviews and conceptual tools from environmental philosophy when viewed through Nyamnjoh's convivial framework, complement ideas of disturbance and landscape domestication in providing an alternative understanding of the landscape or the forest as an integrated whole, a common home (Chimakonam, 2017), characterised by the interconnectedness and web of relations between humans, ancestors, spirits, plants, animals and other entities. These worldviews strongly emphasise the interconnectedness of humans and the environment (Behrens, 2014). They do not consider humans as external to the so-called 'natural world',

unlike the positivist worldview that underlies the concept of disturbance. African relational views offer a perspective to think of humans as ‘part and parcel’ of the forest landscapes, rather than a disturbing external element, and does not presume a priori its negative or positive impact on other entities or webs of relations. Etieyibo (2017: 637) explains that *ubuntu* considers ‘that all beings including humans, God, spirits (nameless dead and ancestors), animals, and inanimate beings belong together in a “community of beings”’. Through this, reality is seen as a closed system where everything hangs together, where the spiritual, physical or human worlds overlap. The interconnection between beings or entities and the interface between humans, the physical and ‘supernatural’ realms, are sometimes inscribed in the landscape through specific vegetation types, sacred places, sacred trees and so on, visible in the forest biodiversity and structure that ecologists study (Obiang et al., 2014; Walters et al., 2019). The notions of *ukama* or *ubuntu*, as place-based concepts, show an ‘aliveness of place’ and enable people to ‘build bridges across different entities’ (Woldeyes and Belachew, 2021: 67, 70).

These worldviews and theoretical insights from environmental philosophy allow us to go beyond dualistic thinking. Indeed, it is important to note that a worldview that stresses the interconnectedness, of all living beings (Sindima 1990 cited by Behrens, 2014) and puts relationality at the centre of the understanding of the world (Ikeke, 2015), does not entail collapsing differences between entities or phenomena, or denying socially-embedded logics of prioritisation. Thinking of the interconnectedness of the human with the biophysical and spiritual realms does not imply there is no distinction between them (Ikeke, 2015). No entities are equal: ‘the universe is a composite of divine, spirit, human, animate and inanimate elements, hierarchically perceived, but directly related and always interacting with each other’ (Oborji 2005, cited by Ikeke, 2015: 183). All entities have their own properties and potency. The idea that all entities, animate or inanimate, bear potency could be a starting point to conceptualise the agency of both humans and non-humans.

This has strong resonances with native Amazonian worldviews, such as those written about by Yanomami shaman Davi Kopenawa. His book *The Falling Sky* presents the end of the world (which we can understand as the corrosive effects of the arrival of capitalism in the form of gold mining enclaves or indeed the arrival of the Anthropocene). Kopenawa’s name was given to him by Yanomami spirits known as *xapiri*, because of his rage at the destruction caused by white people, in particular, by gold miners. The Yanomami, like the African peoples described above, inhabit a world saturated with spirits who are part of nature, including animal ancestors who manifest physically as game. Part of becoming a shaman was taking *yākoana* snuff (which contains the potent hallucinogen DMT, and is also the *xapiri*’s food). The Yanomami world is full of *xapiri*. Animals, trees and plants are spirits: the natural world is alive with non-human persons. Shamans ‘call’, ‘bring down’, and make ‘dance’ *xapiri* spirit helpers, the primordial ‘images’ (*utupē*) of a highly heterogeneous (and potentially infinite) set of beings, entities, and objects. The triangulation of animal ancestors (*varori pē*), game (*yaro pē*), and shamanic animal images (also *varori pē*) is a fundamental aspect of Yanomami ontology (Kopenawa, 2013: 501). His narrative reveals a worldview with striking similarities to *ohanife*, *ubuntu* and *ukama*:

I grew up spending my time in the forest, and this is how little by little I started to see the *xapiri*. My attention was always focused on game and during the night the images of the animal ancestors presented themselves to me. . . . This often happened to the elders’ children, in the time when the white people were still far away from our forest. But since they have gotten close to us, the children and the youngsters are not the way we used to be. Today, the power of the *yākoana* often scares them. They are afraid that they will die from it, and sometimes they even lie to themselves to the point of thinking that one day they could turn into white people.

*The Falling Sky* provides a powerful exposition of how the actual destruction of Indigenous (and by extension other subaltern) worlds by industrial extractivism is the principal way the Anthropocene is made manifest in tropical forests. A key insight is that what is at stake, alongside nature and particular ways of life, are other-than human persons such as spirits. These are all features of Native Amazonian and African ‘worlds’ where the destruction of sacred places and spirits means the end of the world for these peoples, according to them (Blaser and de la Cadena, 2018: 1; Walters, Bifane Ekomi, Hymas submitted).

The focus is that the centrality of relationality and wholeness in many African and Amazonian worldviews, can help theorise human-environment relations differently, in order to reach a less incomplete understanding of the complex histories of forests and landscapes in Africa. Although common features of African worldviews in relation to the environment have been identified (Behrens, 2014; Ikeke, 2015; Kelbessa, 2018), our purpose is neither to apply the above concepts everywhere, nor to deny the facts that worldviews change over time and that different perspectives may coexist at the same time within societies, even at an individual level. Tangwa (1996) underlines the erosion of worldviews in relation to the environment due to colonialism, resulting in the imposition of European languages and systems of education and the introduction of Christianity. However, different, hybrid or opposite worldviews may (and should) coexist, be in tension and contradiction, between and within individuals and communities while informing practices on the environment, depending on the context and the stakeholders involved.

*Ubuntu*, *ohanife* and *ukama*, relationality and wholeness help to show how it is important to look at concepts and theoretical insights from various disciplines (e.g. environmental philosophy and ecology), to foster conversations between various traditions of knowledge, across geographies, in order to reduce the dominance of some concepts that sustain an incomplete view of forests and landscapes. The above discussion also underlines the theoretical potential of notions and ideas grounded in local belief systems, to foster a critique of dominant western concepts and dualistic views, in order to move beyond narrow ways of thinking about tropical forests. Nyamnjoh highlights the importance of documenting local or popular cosmologies for their ‘epistemological significance’ and fecund role in theory-building (Nyamnjoh, 2015).

To put the three different perspectives we have outlined into dialogue (disturbance, landscape domestication and African worldviews), we will now look at how each of them would understand sacred forests. Sacred forests are prevalent around the globe and important to cultural heritage and conservation (Barrow, 2019). They encompass wide variety of ecological types, along a spectrum from ‘no evidence of human impacts’ to ‘anthropogenic’ in terms of species composition. They are also associated with a variety of forms of social valuation and institutions. But what they typically share is that the vegetation is afforded a degree of conservation by virtue of its being sacred (Bhagwat and Rutte, 2006). As spaces that are at once cultural and natural, they provide an interesting example to go beyond disturbance and landscape domestication as concepts.

The weaknesses of the concept of disturbance when applied to sacred groves are clear in a recent example by Kossi et al. (2021) who indicate that 57% of the sacred groves located ‘at former settlements’ in northern Togo are disturbed by their specific management practices and human activities, which leads to a significant reduction in the floristic diversity. Kossi et al. call for ‘action to safeguard the sacred groves and promote community forestry that respects the principles of biodiversity conservation’ (Kossi et al., 2021). It is easy to expose the limits of such an approach, by asking, at what historical moment does a human-made sacred forest located on the site of an old settlement become ‘natural’ in order that it can then be ‘disturbed’? This is distinct from African cosmologies where human culture is seen as an extension of the natural world rather than separate from it (Lanz, 2000: 113/114).

Fraser et al. (2016) described what they referred to as sacred agroforests in northwestern Liberia that had an understorey of tree crops (originally Kola and more recently Cacao), an overstorey of tropical forest species located on fertile anthropogenic dark earths that mark the archaeological sites of historic settlements (Fraser et al., 2016). A historical ecologist talking about domesticated landscapes might say that the Loma people of this region intentionally enriched soils to be able to cultivate tree crops and improve the productivity of the landscape, or they might see it as a form of niche construction, or as a kind of biocultural heritage. But if ask you the Loma themselves where these sacred agroforests are located and whose ancestors created them about these places, they say they are ‘old town spots’. Cutting and burning is forbidden here, although this is sometimes challenged by the youth, who in some instances cut them down to produce chilli peppers for the market (Fraser et al., 2015). The reason cutting and burning are forbidden for the Loma is that two of its most common tree species are linked to people: *Ceiba pentandra* – linking them to ancestors since it was used to mark grave sites prior to the practice of marking with headstones, and *Cola nitida* which links them to the living, as mothers plant umbilical cords wrapped around seeds, thereby linking the Cola tree to the person the baby will become. More profoundly, the reason the spaces are sacred is linked to the presence of the metaphysical power ‘*salɛ*’, which is a feature of ancestors, trees, and ritual objects. If we accept that these forests are neither disturbed, nor domesticated landscapes, we find ourselves at Nyamnjoh’s crossroads of different ways of thinking. We can simultaneously draw from Western ideas of disturbance and landscape domestication, understanding that people have shaped these landscapes, understanding that the vegetation is indeed different from a forest that is not an ‘old town spot’, while also acknowledging the spiritual dimension of these places, which link the Loma to their ancestors.

## Concluding discussion

In this paper we have grappled with the question of what is the best way to think about humans and the tropical forests in the Anthropocene. We looked at how debates on the interplay of natural and cultural forces shaping tropical forested landscapes have been influenced by the Anthropocene concept. We argued that disturbance and ‘landscape domestication’ (two concepts commonly used to answer this question) despite their merits, yield uncomplete understandings of tropical forests in the Anthropocene, and should be complemented with concepts from the worldviews of forest peoples themselves. We provided examples of *ohanife*, *ubuntu*, and *ukama* from Africa, noting the resonances of these concepts with those of Amazonian Indigenous worldviews, looking at the example of Yanomami shaman Davi Kopenawa. Together these concepts express what can be seen as an ‘eco-bio-communitarianism’ embracing humans, God, spirits, ancestors, animals, and inanimate beings as together comprising a ‘community of beings’ irreducible to the culture-nature divide (moving beyond disturbance) and allowing for the agency and personhood of non-humans (moving beyond historical ecology).

Our point is that thinking about the Anthropocene can enriched/discussed by other concepts/theories proposed by other researchers dealing with relatedness/relationality/wholeness to understand interactions between human (living and ancestors), non-human and biophysical worlds etc, in African and indeed Amazonian contexts. A related issue is the devaluation of non-academic knowledge and perspectives, also a problem for Amos Tutuola, the Yoruba who inspired Nyamnjoh’s (2017) work on the subject. This is problematic for researchers producing ‘scientific knowledge’ based on ethnographies and oral sources (see Okoro, 2008). These oral sources and ethnographic data (e.g. ethnoecological knowledge about forests) are considered only as raw data that would become ‘real knowledge’ after analysis by researchers (Nhemachena, 2016). This raises the problem

of the dominance of scientific knowledge, which in many cases could not be produced without non-academic knowledges.

Moreover, while the term ‘Indigenous’ (people/knowledge/scholars etc.), which is widely used in the Americas, and which makes sense (politically, historically, intellectually) because of the settler colonial history that transformed these continents, the term is not directly equivalent or uniformly relevant in the African context (cf. Lane, 2014). Even in the Americas, the dominance of the term Indigenous can obscure other non-Indigenous peoples (Fraser, 2018). So, depending on the context, it may be better to use other terms to describe ‘non-hegemonic’ knowledge/perspectives as non-Western, rather than ‘Indigenous’. It also depends on how people or researchers qualify themselves. In the same spirit, this paper’s title uses the plural African perspectives so as to avoid the same trap of reification/universalisation.

The work of Todd (2016) can help in treating the notion of Indigeneity with due care. She calls for a decolonial approach that explicitly acknowledges the contributions of Indigenous thinkers whose work has significantly contributed to current trends in Western scholarship. It is part of a deep reckoning with ‘indebtedness’ that is part of keeping with convivial epistemologies. This recognition is necessary in order to address ongoing structural colonialism in the academy that marginalises Indigenous, black and non-Western scholars while at the same time appropriating their labour and thought without due recognition. These voices need to be brought from the margins to the centre of academic discourses and debates (Nyamnjoh, 2020). Recognising and working with these ideas, and collaborating with these colleagues can transform our understanding of forests, and also change our disciplines. Many disciplines are opening up to Indigenous ways of viewing the world, including in international policy circles, such as in the International Panel on Biodiversity and Ecosystem Services (IPBES) (Pascual et al., 2023; Tengö et al., 2017), creating dynamic shifts in perspectives of how Indigenous and local knowledges are valued. Importantly too, various examinations of pathways towards much needed transformation continue to point to the centrality of pluralising sustainability knowledge and experiences, including through the inclusion of local and Indigenous perspectives (Escobar, 2020; Hamilton and Ramcilovic-Suominen, 2023; Hernandez and Spencer, 2020).

We have shown how ‘disturbance’ and ‘domesticated landscapes’ each limit us from understanding forest history and how it relates to the Anthropocene. However, by adopting Nyamnjoh’s Conviviality framework, and working with other knowledge bases and worldviews of forests, we can obtain a more complete understanding of the tropical forests in which we research. We encourage ecologists, conservation scientists and historical ecologists to embrace a diversity of views and recognise the limits and incompleteness of Western ecological thinking within and against the Anthropocene, with an aim to decolonise ecology (Ferdinand, 2022). They can begin by incorporating concepts from forest peoples’ worldviews into their work, and engaging with them and with the work of researchers working in these areas.

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## Notes

1. As we discuss later in this paper, disturbance could be natural or anthropogenic. However, our focus in this paper is anthropogenic disturbance in the context of human interaction with tropical forests.
2. Of course, some more sophisticated positions that we would group as disturbance would include some humans, usually those classified as 'Indigenous' as being benign vis-à-vis or even stewards of nature. These discourses, including for example Half-Earth, are problematic in that they then exclude the 'non-Indigenous' from forests (Lewis et al., 2019; Pritchard and Brockington, 2019).
3. For instance, Brosius and Hitchner (2010: 143) show that the biocultural diversity perspective lacks the due recognition of the 'creative possibilities that can emerge from human agency and processes of hybridity', being narrowly concerned about biodiversity and cultural diversity loss and failing to recognise how biodiversity is produced and fostered by local communities (Brosius and Hitchner, 2010: 153, see also Elands et al., 2019). These perspectives have still not displaced the dominance of the 'disturbance' perspective, which still underlies many approaches to the conservation of tropical forests globally.

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