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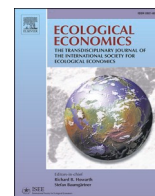
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Rethinking Economic Practices and Values As Assemblages of More-Than-Human Relations

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ABSTRACT

The relational turn in the academic literature on environmental values explores ontologies that rethink the dualistic, hierarchical separations of humans from nature. In particular, the consideration of a plurality of values and ways in which humans connect to nature has brought new insights on the dynamic interconnections between people, place and environmental processes, all highly relevant for the world's sustainability challenges. However, many conceptualizations of economic practices and values are still predominantly dualistic and anthropocentric. To overcome this human-nature divide we propose a conceptual integration of relational values with assemblages of more-than-human relations, illustrated with examples from the literature and ongoing empirical research. These concepts offer a way of representing meaningful and dynamic interrelationships, including humans, physical elements, materials (e.g. technologies, tools), immaterial entities (e.g. sounds, lights, colors), and other non-human beings. We argue that such conceptual integration provides a useful framework to rethink diverse economies as the processes through which humans and non-humans co-constitute their interrelated livelihoods. With this, we extend the relational turn to research on economic human-nature connections, following the call of many scholars in the field of ecological economics to unveil non-utilitarian values and consider multiple economic agencies.

1. Introduction

The academic literature on environmental values is currently experiencing a relational turn. This turn is characterized by the exploration of ontologies that seek to rethink the dualistic, hierarchical separation of humans from nature and to consider a plurality of values in order to better understand their dynamic interconnections to face the world's sustainability challenges (Descola, 2013; Pascual et al., 2021). Relational perspectives, with their long-standing tradition in human ecology (Keleman Saxena et al., 2018), can help unpack the multiple ways in which humans connect to the rest of nature and value its importance (West et al., 2020). In this paper, we apply a relational perspective to economic practices and their underlying values (hereinafter referred to

as “diverse economies”). We consider that the relational turn should further explore diverse economies as one important way through which humans and the rest of nature connect with the aim of sustaining their interrelated livelihoods (Gibson-Graham and Miller, 2015).

Many conceptualizations linking economies and human-nature relations are still predominantly dualistic and anthropocentric (Massenberg, 2019; Washington and Maloney, 2020). Heated debates have emerged, for example, around the role of the concepts of ecosystem services (ES) and nature's contributions to people (NCP) in explaining human-nature relations. It has been argued that ES and NCP continue to recognize mainly anthropocentric representations and fall short at rethinking hierarchical separations that are considered a cause of the sustainability crisis (Barron and Hess, 2020; Muradian and Gómez-

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Baggethun, 2021; O'Connor and Kenter, 2019). Additionally, economies involving other purposes than human's utility-maximization are generally overlooked in research informing environmental management for sustainability (Hodgson, 2012; Schill et al., 2019). Scholars from the field of ecological economics have therefore called for unveiling non-utilitarian values and for considering more-than-human agencies in diverse economies to avoid risks of excessive instrumentalization and commodification of nature (Kenter, 2020; Muradian and Gómez-Baggethun, 2021; Washington and Maloney, 2020). This includes propositions for shifting from a "morality of utility" towards one of care, including "the allocation of property rights and the participation of nature in the community of justice" (Muradian and Gómez-Baggethun, 2021).

A non-anthropocentric and relational perspective on economies needs to challenge the conception of humans as subjects with privileged agency over a non-human nature. Drawing on Actor-Network Theory, we refer to the "more-than-human" as a way to acknowledge that fixed boundaries between discrete entities, such as humans, non-humans and nature, get blurred when they are assessed as entwinements of heterogeneous entities constantly affecting each other¹ (Durand and Sundberg, 2019; Keleman Saxena et al., 2018; Latour, 2017). In this line of thought, Assemblage theory affirms that mutual affections and associations can lead entities to temporarily come together and form networked identities called "assemblages", always subject to change and novelty due to the dynamics of relations (Turker and Murphy, 2021; Woods et al., 2021). Assemblages can include non-human species and physical elements in the landscape, materials (e.g. technologies, tools) and immaterial entities (e.g. sounds, lights, colors), and other non-human beings (González-Hidalgo and Zografos, 2020; Larsen and Johnson, 2016; Whatmore, 2018). Such a non-anthropocentric perspective invites research, policy and practice to expand on the role of more-than-human entwinements in the formation of economic values and practices, and to rethink economic relations in terms of interrelated livelihoods.

The concept of diverse economies is one of the few that provide an alternative to the otherwise very anthropocentric literature on economies and human-nature relations. It recognizes that economic processes emerge from more-than-human relations responding to situated realities (Healy et al., 2020; Miller and Gibson-Graham, 2019; Yeung, 2005). Diverse economies are combinations of human and non-human practices and abilities in constant co-constitution and negotiation for securing their interrelated livelihoods (Gibson-Graham and Miller, 2015), as we will further explain in Section 3. Several works in this line suggest that combinations of practices and values produce new understandings about the unfolding connections between people and place (Raymond et al., 2021b), involving entwinements of humans and non-humans (Escobar, 2001; Miller and Gibson-Graham, 2019; Moore, 2015; Tsing, 2005).

The perspectives of diverse economies have found little integration in the environmental values literature so far. Existing work on plural valuation of ES and NCP largely focuses on discrete categories of values (intrinsic, instrumental, relational) and not on the dynamic, relational processes that lead to their formation and change (Himes and Muraca, 2018; Raymond et al., 2018; Stålhammar and Thorén, 2019). Such work mostly assumes that economies relate only to the domain of instrumental and utilitarian values of nature (Massenberg, 2019; Pirgmaier, 2021) and that non-instrumental values are necessarily non-economic (Spangenberg and Settele, 2016). It is therefore not surprising that economies are often perceived as merely antagonistic to nature in dualistic representations leaving little room to understanding their entanglements (Moore, 2015). Focusing on relational processes (Cooke

et al., 2016; West et al., 2021) is a key step in overcoming the dissection of humans from nature, and could provide deeper insights into the processes through which diverse economies emerge (Turker and Murphy, 2021).

In the following sections, we aim to explore a relational perspective on diverse economies particularly through the conceptual integration of economies and place. For this, we consider diverse economies to form in places resulting from multiple processes and more-than-human relations (Gibson-Graham and Miller, 2015) involving embodied practices and negotiated values (Raymond et al., 2018; Raymond et al., 2021c). Hopefully, such an exploration can trigger a productive dialogue with the environmental values literature, especially with the notion of relational values (Himes and Muraca, 2018), and provide novel ideas for research transcending anthropocentric and utilitarian representations of economies (Healy et al., 2020; Miller, 2020).

2. Economic Human-Nature Relations Are Not Only Utilitarian

The association of economies to utilitarian values of nature originates in the longstanding epistemological predominance of so-called neoclassical economics and its strong influence in research, policy and practice at the interface of economic and environmental relations. Neoclassical economics' theories and methods generally build on deterministic conceptions of morality and human behavior characterized by rational, optimizing and self-interested individuals primarily seeking utility-maximization (Levine et al., 2015). Utilitarianism is a wide philosophical family with different approaches in which "utility" can refer to individual or collective happiness, to preferences or to pleasant experiences (Varner, 2008). Nevertheless, its original plurality evolved within neoclassical economics towards a monetized measure of the individual satisfaction obtained from the consumption of goods and services (Krall and Gowdy, 2012; Massenberg, 2019; Riley, 2018).

Utilitarianism translates within capitalist relations into an unrestricted appetite for commodities. These are products whose exchange-value, or the quantitative value relative to other products measured in monetary terms, prevails over other instrumental values such as use-value, an expression of the usefulness of a product depending on its material qualities and the wider production context (Pirgmaier, 2021). With the expansion of capitalist values and power-relations, the monetized version of utilitarianism has been extended to human-nature relations (when referring to "nature", we include non-human and more-than-human relations), in which rational humans supposedly make informed choices with clearly organized preferences on how to use a non-human nature merely as a resource for utility-maximization (Gibson-Graham et al., 2016; Wegner and Pascual, 2011). Utilitarian neoclassical models have been leading global economic and environmental assessments and policies despite theoretical and empirical inconsistencies (Gowdy et al., 2010; Pirgmaier, 2021) and warnings that their widespread real-life application drives ecological degradation and biodiversity loss (Lizarazo, 2018; Muradian and Gómez-Baggethun, 2021).

Critics of the utilitarian emphasis especially target its insistence on unlimited economic growth and its emphasis on monetized exchange-value that drive the commodification of human-nature relations (Himes and Muraca, 2018; Moranta et al., 2021; Muradian and Gómez-Baggethun, 2021). Commodification is a process within the capitalist system that veils diversity as it assimilates all relations and entities to goods and services exclusively produced for sale, and whose value is determined in utilitarian terms within markets through pricing mechanisms and commensurable values (Smessaert et al., 2020). This process subordinates and disregards human-nature relations that cannot be monetized or quantified, encouraging their replacement by commodified relations (Washington and Maloney, 2020). For instance, if the economic importance of ecosystems to people relies just on their contribution to utility-maximization, then a biodiverse ecosystem can easily be replaced by a monoculture, a mine or a dam if, with that, utility

¹ Relational perspectives do not necessarily erase discrete categories or duals, but expand the focus towards the relational processes up to the point where the discrete categories cease being the center of attention. Certainly, duals are still a necessary reference in order to advance towards rethinking dualistic concepts (Gibson-Graham and Dombroski, 2020b, p. 9).

increases.

Some anthropocentric perspectives in biodiversity conservation still appeal to monetized utilitarian values as the main strategy to sensitize towards the need to preserve ecosystems, raising concerns of facilitating commodification (Muradian and Gómez-Baggethun, 2021). Such perspectives imply that ecosystems and species with little monetary value are worth preserving mainly if they are intrinsically valuable. This further alienates economies from nature (Moore, 2015), restricting biodiversity conservation to places in which it can potentially generate monetary benefits (e.g. ecotourism in protected areas), to rare human-free spaces or with limited human presence, or to contexts of weakened land rights risking land grabbing and the displacement of local populations (Elias et al., 2021; Mollett and Kepe, 2019). Hence, commodification denies the possibility to also preserve biodiversity, and its related human-nature entanglements, in places where diverse economies can be compatible with biodiversity conservation independently from its monetized utilitarian value.

The utilitarian emphasis also disregards the plurality of values and practices through which diverse economies entangle in more-than-human relations. It discounts that other entities than humans can take part in the shaping of economies (Dwiartama and Rosin, 2014; Healy et al., 2020; Miller, 2020). For example, pests continuously influence agriculture and food systems by affecting crops and harvests (Contesse et al., 2021); pollinators trigger cultural, economic and ecological processes in farming landscapes (Cely-Santos and Lu, 2019; Shackleton et al., 2018); and affective relations between humans, technologies and plant-varieties shape agricultural practices and their outcomes (Morita, 2017). With commodification, the diversity of spatial-temporal relations is replaced by simplified versions reflecting deterministic and unidimensional understandings of economies (Barron and Hess, 2020; Peck et al., 2020), e.g. forests and diversified agriculture are replaced by plantations and export-oriented monocultures (Cely-Santos and Lu, 2019; Chao, 2022).

Several alternative conceptualizations of diverse economies transcend the neoclassic utilitarian paradigm. They challenge its hegemonic use within capitalist market-based relations, by unveiling the multiplicity of practices that, despite not being totally disentangled, exist amidst complex power-relations within dominant economic systems (Gibson-Graham and Dombroski, 2020b; Massenber, 2019). Research has revealed a plurality of values in relations constitutive of solidarity and community economies (Gibson-Graham et al., 2013; Wanderley, 2015); economic geographies (Bathelt and Glückler, 2003; Peck et al., 2020); postcolonial (Grosfoguel, 2011; Zein-Elabdin, 2009) and feminist economies and political ecologies (Berman-Arévalo and Ojeda, 2020; Gibson-Graham, 2014; González-Hidalgo and Zografos, 2020; Zelizer, 2012). Some approaches analyze more-than-human relations in largely overlooked economies sustaining rural livelihoods. They include theorizations of agri-food systems (Isakson, 2009; Le Heron et al., 2016; van der Ploeg, 2016), research on territorial struggles in extractive contexts (Caretta and Zaragocin, 2020; Ulloa, 2020), and works on daily-life practices like cooking, home-gardening, seed exchanging or weaving (Baumann, 2021; Díaz-Reviriego et al., 2016; Turner et al., 2020). Such perspectives also provide notions of how links between economies and nature can involve embodied experiences of inequalities, power relations and conflicts, creativity and adaptation to change, and a plurality of affections, meanings and values. More recently, scholars working on diverse economies have built on relational approaches to overcome dualistic and antagonistic perspectives of the links between economies and nature and unveiling a wider spectrum of relations (Healy et al., 2020; Miller, 2020).

3. Introducing A Relational Perspective of Diverse Economies Through Senses of Place and Assemblages

In this section, we present a relational perspective of diverse economies to consider more-than-human entanglements by combining the

concepts of assemblages, senses of place, and relational values (Fig. 1). We draw on Gibson-Graham and Miller's idea that economies are not a "unified domain", but a diversity of processes and interrelations of "livelihood creation", including "processes of coexistence and interdependence" within more-than-human relations (2015, p. 4). Hence, we understand *diverse economies* as assemblages through which humans and non-humans co-constitute and negotiate the provisioning practices and abilities that support their interrelated livelihoods.

Assemblage theory offers a relational perspective of social life considering more-than-human agency within webs of relations. Assemblages are ongoing encounters of disparate elements, including biophysical, material and immaterial ones such as humans, plants, animals, microorganisms, technologies, tools, objects, practices, values, policies and narratives (Hope, 2020; Li, 2007; Woods et al., 2021). These encounters happen through the combination of situated human and non-human practices and abilities (Darnhofer, 2020; Raymond et al., 2018). For example, rural home gardening combines interrelated and heterogeneous elements such as seed sharing, ploughing, breeding, sowing, harvesting, composting, pest-control, insect pollination, associations of plant and animal species, and the metabolism of soil microorganisms. Diverse economies assemble more-than-human relations with different rhythms and autonomous trajectories that intersect at multiple places and spatial-temporal scales (Healy et al., 2020; Miller, 2020; Woods et al., 2021). As a result, a diversity of values and practices unfold and affect how humans experience those relations, which in turn affects the values and practices, while also influencing the abilities of humans and non-humans to sustain their livelihoods (González-Hidalgo and Zografos, 2020; Raymond et al., 2018).

Consequently, the lonely utility-maximizing individual of the neo-classical economic models gives way to a broad web of more-than-human relations that can co-produce assemblages through the

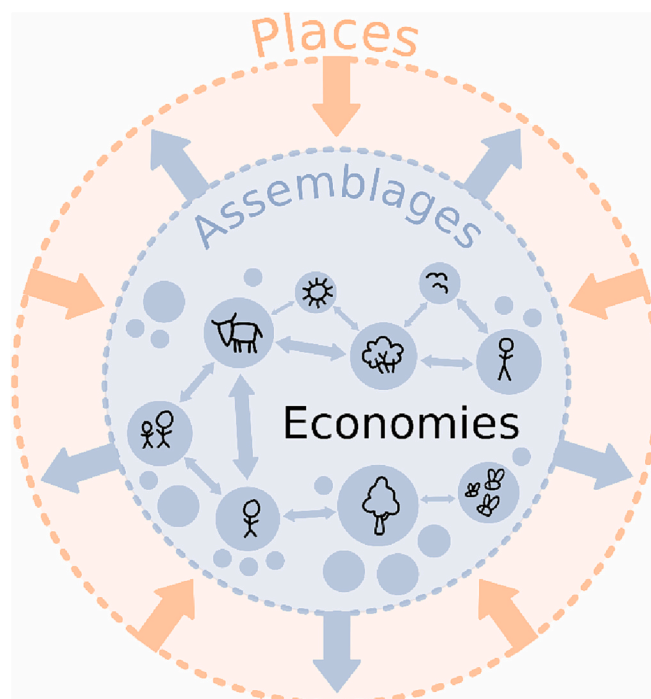


Fig. 1. The conceptualization of diverse economies as assemblages of more-than-human relations involves four key considerations: (1) assemblages are dynamic webs of relations; (2) senses of place emerge from people's experience of assemblages; (3) economies are a type of assemblage that include values, practices and abilities involved in the co-constitution and negotiation of interrelated livelihoods; (4) economies produce places, and places produce economies.

Figure design: Jan Hanspach

combined practices and abilities of the encountering entities. Such relations include mutual affections, negotiations and power dynamics through which economic assemblages are temporarily stabilized, transformed and reassembled (Darnhofer, 2020; Sarmiento, 2020; Turker and Murphy, 2021):

“...human agency has always worked in concert with non-human processes and material objects – from photosynthesis to economic practices of exchange, to research, to the curative powers of medicine, to devices for measurement and valuation – in order to construct a shared world. If our understanding of human agency doesn’t make sense without these processes, objects, devices, measurements and systems of valuation, in what sense is agency confined to the human? (Healy et al., 2020, p. 396).

This perspective entails that agency is not unidirectional but rather distributed (Raymond et al., 2021b). Although the combination of agencies do not necessarily lead to concerted arrangements and can instead generate conflictive ones, both human and non-human entities have an ability to “shape the processes, relationships and outcomes of economic life” (Miller, 2020, p. 402). Thus, the notion of agency is extended to a wider heterogeneity of interdependent entities that affect the processes through which humans and non-humans “make”, “provide” and “receive” their interrelated livelihoods (Miller, 2020, p. 405; Turker and Murphy, 2021).

In this line of argumentation, conceptualizing diverse economies as assemblages implies that their constituent values and practices emerge from encounters between heterogeneous entities occurring in given places through time. These encounters are imbued with meanings associated with human’s lived experiences. Therefore, it is crucial to also consider assemblages with respect to the multiple socio-spatial relations grounded in senses of place as a “plurality of place-related meanings, interpretations and values that are continuously produced, contested, negotiated, reconstructed and embodied by individuals and among collectives of people” (Raymond, Kaaronen, et al., 2021a, p. 6).

The concepts of place and senses of place help unveiling the different ways in which people experience the networked agency of economic assemblages. Places are similar to meaningful events or moments gathering together multiple trajectories, thus creating spatial-temporal entanglements or assemblages (Agnew, 2005; Massey, 2005; Woods et al., 2021). Both human and non-human entities participate in such events by means of their abilities and features that can enable, constrain or dissolve assembling processes (Raymond et al., 2018; Turker and Murphy, 2021). People can experience assemblages by means of their senses of place, involving values, practices, meanings, sensorial embodiments, among others (Miller, 2020; Raymond et al., 2017). For instance, diverse economies can shape places and stimulate senses of place by combining values (e.g. productivity, solidarity, reciprocity), knowledges and technologies (e.g. properties and uses of wild plants, harvesting seasons and tools) in concrete practices (e.g. farming, collecting, trading) (Cooke et al., 2016, p. 832; Gibson-Graham and Dombroski, 2020a; Ober and Sakdapolrak, 2017). The rapid transformation of a place due to irruptive trajectories (e.g. displacement, urbanization, commodification, deforestation) can hinder the experience of place (Drenthen, 2009) and generate fissures in assemblages (Woods et al., 2021). This can spark new trajectories and encounters, potentially disrupting existing senses of place, undermining experiences or triggering new ones (Chao, 2022; Lau et al., 2021). Fig. 2 exemplifies these ideas with the case of wild honey in Western Bolivia: a diverse economy affected by the trajectories of local communities, native bees, globalized agroindustries, timber and honey.

The relational perspective brought by the concepts of place and assemblages emphasizes the dynamism of diverse economies. Relations transform and, with this, economies can be undone, dis-assembled and re-assembled (Turker and Murphy, 2021) (Fig. 2). The encounter of heterogeneous relations triggers negotiations among the participants reflecting their power to define the terms of the assembling processes

(Pierce et al., 2011). In consequence, new pathways and webs of relations are continually being formed (Raymond et al., 2018). This implies that diverse economies are constantly being shaped and re-shaped: for instance, farmers and insect or bird species can share and negotiate their interests and needs in the use of specific plants; there can be complementarities or divergences in the uses, potentially leading to mutually benefiting assemblages, such as farmers-plants-pollinators (e.g. Cely-Santos and Lu, 2019; Shackleton et al., 2018).

Following Massey (2005), the negotiations in place refer to the ordering of the temporary spatial encounters of the participants’ heterogeneous trajectories. They involve different abilities and power-relations in the definition of boundaries, limitations, constraints, of the conditions of assembling, and in the acknowledgment of the existence of others (Turker and Murphy, 2021). In this sense, values and practices reflect and affect the negotiations of co-constituted livelihoods. For example, agricultural practices implicate negotiations between the needs of farmers to meet their livelihoods, the requirements of markets, the quest of birds and insects to forage and reproduce, the need of plants for nutrients and water, and of forests and the whole ecosystems for vital space. Considering how diverse economies assemble in places through negotiations helps understanding the more-than-human forces at work and the power-relations involving, for example, inclusions, exclusions, dominance and difference (González-Hidalgo and Zografos, 2020; Sarmiento, 2020).

4. Diverse Economies Blend Instrumental and Relational Values

Values are fundamentally important for the formation of diverse economies, affecting the experience of placeness and assemblages. They are ways in which people assign importance to human and non-human entities and their relations (Muraca, 2016; Pascual et al., 2017). Drawing on Moore (2015), values exist where there are relations to value, for instance, economies produce the places and the assemblages that enable relations and thus make the valuing process possible. Values reveal and shape people’s experiences and ontological conceptions about what is morally right and about what entities exist in the world (Muraca, 2016). They can also refer to how human and non-human entities form diverse economies (Barron and Hess, 2020). People do not necessarily rationalize their experiences nor do they fix values of non-human entities according to sorted preferences and utility-measures (Gibson-Graham and Dombroski, 2020b; Stålhammar and Pedersen, 2017). In general, entities do not possess fixed values, because values emerge from their relations (Muraca, 2016; Stålhammar and Thorén, 2019). Non-humans can influence even monetized utilitarian values by acting within assemblages. For example, a recurrent plague or a climatic event can make agricultural products more expensive by hampering the production processes. They can also increase the importance to people of more resistant, locally adapted species that support the adaptation of practices, independently of their market price (Morita, 2017). Values reflect how humans experience the diverse assemblages of more-than-human trajectories encountered in given places.

The environmental values literature on ES and NCP mainly uses discrete, sometimes overlapping, categories of values, such as intrinsic, instrumental and relational (Chan et al., 2018; Pascual et al., 2017; Rincón Ruiz et al., 2020). Intrinsic values refer to entities and relations that are important for their own sake, “independent of human needs, meanings, interests or preferences” (Muraca, 2016). They have no direct link to economies, because economies usually involve negotiations between human and non-human entities. Building on Himes and Muraca (2018), instrumental and relational values can be simultaneously present in instrumental relations (e.g. involving food ingredients, materials, agricultural inputs) and in non-instrumental relations (e.g. kinship, care, sacredness), which is a reason why the boundary between them can be blurry. Instrumental values characterize the importance of relations considered as means for specific ends. These are common relations in economies, in which case instrumental values can refer to more than





 <p>Panel 1 - Relational and instrumental values blend in economic practices: Chiquitano people from the San Juan de Lomerío indigenous community in Western Bolivia's Chiquitanía narrate how they have collected wild honey for generations so it has become part of their cultural identity. Despite the increased offer of industrial medicines in local shops, wild honey is still a major ingredient in medicinal preparations together with wild plants to treat particularly respiratory problems, especially during the Covid pandemic.</p>	 <p>Panel 2 – Diverse economies are assemblages of human and non-human entities: People from San Juan have traditionally collected wood materials from trees in selected places in their community forests that, from time to time, host bee hives. This has triggered negotiations between people and bees: some trees are left without cutting because they host bees that make valuable honey, or that are perceived as aggressive and dangerous, while others are cut partially or totally to collect the honey from “friendlier” bees. The abilities of bees to produce honey with specific characteristics and their behavior towards humans affect economies and influence people's senses of place where they usually collect wood materials.</p>
 <p>Panel 3 - Assemblages and places are transformed by changing economic relations across scales: The Chiquitanía region includes one of the most important tropical dry forest in South America, estimated in more than 20 million hectares distributed over Bolivia, Brazil and Paraguay (Devisscher et al., 2016). This forest is home of 27 registered species of stingless bees (Townsend et al., 2021). Their habitat is being threatened by massive deforestation and forest fires, amidst the fast expansion of the agricultural frontier mainly driven by large-scale industrial agriculture, cattle raising and timber extraction (Fundación Tierra, 2019). The construction of new roads and the migratory dynamics brought by agroindustries has attracted new actors and created new markets for timber and honey. Increased demand could create a push for higher volumes of extraction, transforming previously existent assemblages in chiquitano's communities.</p>	 <p>Panel 4 – Diverse economies are constantly changing and subject to power struggles: The arrival of timber industries already in the 90s introduced new monetized market logics and new tools (e.g. chainsaws) that facilitated the work of cutting trees and gathering honey. While people from San Juan have their own management plan for their forests, there are increasing interests and pressures from timber, food and cattle industries, as well as demographic changes, which risk promoting deforestation as seen in the rest of the Chiquitanía. Some people affirm that honey gathering is becoming more and more a secondary practice subordinated to an accelerating timber extraction. The negotiations between people and bees are becoming more unequal in this context of rapid transformations of their interrelated livelihoods.</p>

Fig. 2. Diverse economies of humans and bees assembling in Bolivia's Chiquitanía region. This example is based on preliminary results from 33 interviews in the community of San Juan de Lomerío in 2021. It is part of ongoing empirical research exploring economies, assemblages, places and values in the region. We will present the results in forthcoming publications. More information: (<https://www.bioculturaldiversity.de/>). Photos: Stefan Ortiz-Przychodzka.

Panel 1 - Relational and instrumental values blend in economic practices: Chiquitano people from the San Juan de Lomerío indigenous community in Western Bolivia's Chiquitanía narrate how they have collected wild honey for generations so it has become part of their cultural identity. Despite the increased offer of industrial medicines in local shops, wild honey is still a major ingredient in medicinal preparations together with wild plants to treat particularly respiratory problems, especially during the Covid pandemic.

Panel 2 - Diverse economies are assemblages of human and non-human entities: People from San Juan have traditionally collected wood materials from trees in selected places in their community forests that, from time to time, host bee hives. This has triggered negotiations between people and bees: some trees are left without cutting because they host bees that make valuable honey, or that are perceived as aggressive and dangerous, while others are cut partially or totally to collect the honey from “friendlier” bees. The abilities of bees to produce honey with specific characteristics and their behavior towards humans affect economies and influence people's senses of place where they usually collect wood materials.

Panel 3 - Assemblages and places are transformed by changing economic relations across scales: The Chiquitanía region includes one of the most important tropical dry forest in South America, estimated in more than 20 million hectares distributed over Bolivia, Brazil and Paraguay (Devisscher et al., 2016). This forest is home of 27 registered species of stingless bees (Townsend et al., 2021). Their habitat is being threatened by massive deforestation and forest fires, amidst the fast expansion of the agricultural frontier mainly driven by large-scale industrial agriculture, cattle raising and timber extraction (Fundación Tierra, 2019). The construction of new roads and the migratory dynamics brought by agroindustries has attracted new actors and created new markets for timber and honey. Increased demand could create a push for higher volumes of extraction, transforming previously existent assemblages in chiquitano's communities.

Panel 4 - Diverse economies are constantly changing and subject to power struggles: The arrival of timber industries already in the 90s introduced new monetized market logics and new tools (e.g. chainsaws) that facilitated the work of cutting trees and gathering honey. While people from San Juan have their own management plan for their forests, there are increasing interests and pressures from timber, food and cattle industries, as well as demographic changes, which risk promoting deforestation as seen in the rest of the Chiquitanía. Some people affirm that honey gathering is becoming more and more a secondary practice subordinated to an accelerating timber extraction. The negotiations between people and bees are becoming more unequal in this context of rapid transformations of their interrelated livelihoods.

utility-maximization (utilitarian values are just one particular type of instrumental value). For example, they can denote individual or collective habits and agreements; they can aim at triggering emotional and sensorial experiences, or at managing conflicts and power relations. Relational values describe the importance of relations considered as ends-in-themselves. These relations are more difficult to replace and to compensate, often reflecting senses of co-dependence and co-constitution among entities, or the recognition of mutual benefits (Jones and Tobin, 2018).

Yet, this perspective on values can also help reveal detrimental economies (Gibson-Graham and Dombroski, 2020a) and guide the understanding of commodification as the appropriation of the practices and abilities of different entities within assemblages (Barron and Hess, 2020; Moore, 2015). For example, people can value simplified, environmentally degraded landscapes at the expense of diversified and more sustainable ones (Hoelle et al., 2022). Plantations of commodities valued for their financial returns and connected to globalized markets often expand into biodiverse areas through intensive extractive practices that can produce, for instance, land grabbing, deforestation, soil and water depletion, thus rapidly transforming local landscapes and reconfiguring economies and livelihoods (Li, 2007; Tsing, 2005). Values can also refer to relations of conflict and negotiation (and be themselves negotiated), or to relations perceived as detrimental or negative, recently called “disvalues” (Liso et al., 2022). Simplified assemblages, including commodified landscapes, can be valued either as means or as ends-in-themselves, meaning that they can involve relational (dis)values reflecting power-relations of dominance that can be difficult to replace.

While discrete categories of values seem useful and plausible in the sphere of social representations and narrations of human-nature relations, they seem less useful to understand how values emerge (Himes and Muraca, 2018; Raymond et al., 2018; Stålhammar and Thorén, 2019) from ongoing assembling processes and embodied experiences. The definition of diverse economies that we have discussed so far provides the opportunity to consider instrumental and relational values as a blending continuum or a gradient emerging from relations. Hence, even though we argue that economies mainly involve instrumental relations reflected in the negotiations of provisioning practices and abilities, such relations can blend different values, i.e. economic values are not necessarily always equivalent to instrumental ones, as suggested for example in Chan et al. (2018). Furthermore, values not only shape assemblages, but assemblages also shape values in a continuous flow within more-than-human relations. Values can be a “fruitful category of classification” in the sphere of social representations (Himes and Muraca, 2018, p. 1) to analyze how people categorize and address their relations with non-humans. Yet, in the sphere of assembling processes and senses of place, it is more useful to consider values as an open-ended outcome of ongoing more-than-human relations.

The relational understanding of values is a key step to de-center the analysis of economies from utility-maximization and to challenge the commodification of human-nature relations, and should be considered separately from relational values as a concept. Commodification is a process that establishes a hegemony of monetized utilitarianism in human-nature relations, favored by the exclusive association of economies to instrumental and monetized utilitarian values within expanding market-based relations. Assuming that only utilitarian values guide economies would entail that the included instrumental relations could be easily substituted by other means to achieve their specific ends. However, this is not necessarily the case for all instrumental relations. As stated by Muraca (2016, p. 29), “...employing an instrument as a means already acts upon the one who is using it (...) by using it we enter a complex relation with it and become another”. In commodified relations, non-human nature is represented as a set of passive resources without agency, and nature’s contribution to people relies mainly on utility-maximization. By acknowledging that instrumental relations can also involve relational values, we open novel analytical pathways for more-than-human economies, extending the notion of agency to non-

human entities within both commodified relations and non-substitutable relations and assemblages.

5. Prospects for Articulating Diverse Economies for Transformative Change

The conceptual integration of diverse economies, assemblages and values of nature, shapes a perspective of economies as processes emerging from more-than-human relations. In this paper, we argued that the conceptualization of diverse economies resulting from assembling processes extends the notion of agency to non-human entities. We considered the idea that diverse economies are not only the result of human agency: assemblages have the ability to act on economies, instead of “nature” merely being a passive resource for human’s utilitarian benefit. Additionally, we integrated the notion that diverse economies produce spatial-temporal configurations that humans experience as places involving blends of relational and instrumental values. Senses of place reflect the economic assemblages as multiple trajectories encountering in space and time, as well as the negotiations and co-constitutions of interrelated livelihoods.

Both the literature on environmental values and on diverse economies have raised the need to challenge commodification and monetized utilitarian approaches to environmental valuation and management for transformative change. This can be done by thinking of diverse economies as a result of more-than-human agency (Barron and Hess, 2020; Gibson-Graham and Dombroski, 2020b; Muradian and Gómez-Baggethun, 2021) and by integrating more pluralistic visions to understand human-nature relations (Pascual et al., 2021). Our relational perspective on diverse economies offers opportunities for further developments in this direction, by:

Providing a framework to rethink diverse economies as a matter of how humans and non-humans encounter each other instead of how a non-human nature exclusively works for humans (Barron and Hess, 2020; Healy et al., 2020). This is a key step in overcoming anthropocentric representations of economies in environmental valuation that prioritize human livelihoods over the rest of nature (Himes and Muraca, 2018). Research on diverse economies can bring more evidence and trigger discussions on mutual affections, more-than-human agencies, and the need to better articulate a morality of care considering ethical negotiations in economic practices (Gibson-Graham and Dombroski, 2020b; Muradian and Gómez-Baggethun, 2021). In particular, diverse economies can help transcending the attention put on unidirectional flows of contributions from a non-human nature to humans, still prevalent in ES and NCP, towards the contributions of assemblages to securing interrelated livelihoods. The 2022 IPBES Values Assessment could support this change at the interface of policy and practice by highlighting the possibility for a morality of care within a diverse set of values of nature (IPBES, 2022). However, the call for a shift away from a morality of utility towards one of care (Muradian and Gómez-Baggethun, 2021) should address the problems of the morality of utility-maximization and its risky focus on monetized measures of utility. This shift can gain much from reclaiming the role of usefulness, or use-value, and pluralizing utility beyond utility-maximization and exchange-value, using the words of Amartya Sen (1981). As argued, not all instrumental values are utilitarian, and they can coexist with relational values, such as care. Understanding how instrumental human-nature relations can involve blends of non-utilitarian, instrumental and relational values is a key step in limiting commodification and unveiling diverse economies in different contexts, including those in which a morality of utility-maximization prevails.

Articulating the processes of assembling in the negotiation and co-constitution of interrelated livelihoods. Diverse economies imply that the co-production of livelihoods, environments and ecosystems (Chambers et al., 2021; Pascual et al., 2021) entails associations and negotiations in which humans are a particularly powerful force, but not the only one. Drawing on Moore (2015) and Barron and Hess (2020), framing co-production as negotiations within assembling processes can trigger

questions in research, policy and practice on how the agency is distributed, who defines the terms and appropriates the results of the processes to secure the interrelated livelihoods. This can link to understandings of diverse economies as ethical actions (Gibson-Graham and Dombroski, 2020a), by reflecting on power-relations in the formation of assemblages, on the distribution and definition of wealth and wellbeing, and on the promotion of more responsible more-than-human encounters. The consideration of senses of place and values is key, because they underline people's experiences of the assembling processes and enable considerations of how different ontological perspectives (Blaser, 2009; Durand and Sundberg, 2019) and plural knowledges of human-nature relations also take part in the negotiations (de Sousa Santos, 2016; Escobar, 2016; Muraca, 2016).

Bringing natural and social sciences closer together in the process of supporting transformative change, by stressing that economic and ecological processes are co-produced (Pascual et al., 2021). Diverse economies are a key driver of change. Instead of considering economies and nature as antagonist, research can observe their dialectical entwinements in places, embodied practices and blends of values. In this line, diverse economies can drive transformative change as a dynamic outcome of the encounter of human and non-human abilities and power the processes of assembling, negotiating and shaping living spaces (Healy et al., 2020; Miller, 2020; Moore, 2015). From this perspective, processes such as landscape diversification and biodiversity conservation are not just properties of static arrangements and managements by a unique human agency (Djoudi et al., 2022). Instead, they are co-produced as lively assemblages in which nature as a whole has the capacity to "induce historical change (to produce ruptures), or to reproduce extant historical arrangements" (Moore, 2015, p. 47).

Finally, the association of assemblages, senses of place and relational values can inform future research in support of the idea that diverse economies and nature are never fully commodified (in terms of Prudham (2020)) because they continually bring each other into being (Gibson-Graham and Dombroski, 2020a). The analysis of fluctuating configurations of agencies within assemblages can enable further assessments of the risks of emerging oppressive relations, and the possibilities and potentials for emancipatory transformative change (de Sousa Santos, 2016; Moore, 2015; Turker and Murphy, 2021). This perspective of diverse economies supports the longstanding efforts that, drawing on relational ontologies in research and action, enable the conceptual and analytical reframing of economic values and practices within the web of life.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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