

Sharing planet Earth: Overcoming speciesism in economics

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1. Is economic growth just a manifestation of planetary growth?

Earth system scientists have proposed the concept of a 'hybrid planet' (Frank, Kleidon, and Alberti 2017). This term refers to the observation that physical and chemical processes unfolding in the human-made domain of the technosphere have achieved geological scales; this has also motivated the proposal to define a new geological epoch, the Anthropocene (J. A. Thomas 2022). However, this proposal has raised some conceptual concerns because, firstly, the domain of the technosphere is not co-extensive with the reach and capacities of human action (Haff 2014), such that the very notion of 'sphere' suggests that it obeys autonomous evolutionary regularities and even laws like the biosphere (Herrmann-Pillath 2018). Secondly, considering the comprehensive and radical requirements of winding down human impacts on the planet to avoid climate catastrophe affecting all life on Earth, wouldn't this imply that with the entry into the Anthropocene, humans must step out of the center, in a Copernican turn moving from anthropocentrism to biocentrism (or, geocentrism and other variants of this idea) (Herrmann-Pillath 2021).

One of the conceptual pillars of the notion of the hybrid planet is the unity of the laws of thermodynamics that Georgescu-Roegen classically invoked to argue for the limits of economic growth (Georgescu-Roegen 2013 (1971)). However, physicists have often criticized his arguments, as despite the growing size of thermodynamic flows driven by human action, they are still minuscule when considering the entire energy budget of the planet, that is, the incoming and outgoing radiation (Kåberger and Månsson 2001). The physicist Axel Kleidon points out that, therefore, the human economy, materializing in the growth of the technosphere, can even play a role in positively enhancing the planet's potential to realize productive work (Kleidon 2023). This follows from the fact that photovoltaics is a technology that directly utilizes the planet's radiation budget, in principle, like photosynthesis. The environmental dilemmas stem from structural distortions caused by particular technologies, mainly fossil-fueled, but not from humans harnessing planetary energy potential.

Kleidon shows in meticulous detail that photosynthesis is far less efficient than photovoltaics in transforming solar energy into useful physical work (sometimes called 'exergy'). Therefore, he envisages that humans can even support the biosphere by intervening technologically with Earth system processes. One of his examples is the water cycle, which relies on water cycling from the oceans to the land in the form of clouds along the temperature gradients that drive wind systems. Once the clouds arrive, they release the water by rain, which in turn supports life, part of which directly takes atmospheric regulatory functions, namely the plants, which are also involved in regulating the water cycle. The technological alternative is to directly desalinate ocean water and

send it to areas where it is needed. Kleidon calculates that this is much more efficient energetically than the atmospheric water cycle. He suggests that humans could use the technology to turn areas like the Sahara into flourishing biotopes.

Of course, this is well-informed science fiction with the pedagogical motivation to demonstrate a key point: Growth is not a phenomenon that is confined to the human economy but is a general natural process that roots in the thermodynamics of the Earth system (Smil 2019; Hall and McWhirter 2023). If we recognize this, could we envisage that economic growth becomes seamlessly integrated with the planet's growth in terms of energetic transformations and transformative potential?

2. What about the looming great extinction on Earth?

The Kleidon argument overlooks one key challenge of our current crisis: The imminent collapse of biodiversity on Earth (Dasgupta 2021). The science fiction becomes a scientific illusion since it only argues on the highest level of aggregation of thermodynamic flows and only considers structural issues in considering the origins of global warming in fossil technologies. But the growth of the technosphere also means that there is a deep structural conflict between the growing size of the technosphere and the sustainability of the biosphere as a complex system of systems, that is of ecological systems (Elhacham et al. 2020; Jenkins et al. 2020). The growth of the technosphere crowds out life on Earth and would subject life on Earth to human technological design.

There are undoubtedly many questions about these ideas, such as whether we could imagine humans successfully transforming large Earth swathes via solar energy-fed interventions into planetary processes. For example, the Sahara is an important provider of phosphate to the Amazon rainforest via the wind system carrying the dust from here to there. Greening the Sahara may entail negative consequences for the rainforest, unless we fertilize it artificially, thus further boosting the technosphere. In other words, Kleidon's vision implies the internalization of the biosphere into the technosphere while assuming human capabilities to orchestrate evolutionary processes in both and between both.

Hence, the challenge is to strike a balance between the biosphere and technosphere, which boils down to the simple question of who claims the surface of the planet to maintain its ways of life. The focus on surface area is a simplification but is usual in many measures of the human appropriation of the earth, such as the ecological footprint or HANPP (Krausmann et al. 2013; Richardson et al. 2023). Accordingly, one idea to limit human impact on Earth system is to exclusively assign a substantial share of the planet to the biosphere (Wilson 2016). In the following, I want to present another option that directly engages economic theory, specifically the theory of institutions. The key idea is to free economics from speciesism.

Speciesism refers to the explicit claim that economics is and has to be anthropocentric, a position that is maintained even by economists who otherwise take ecology seriously (Llavador, Roemer, and Silvestre 2015; Dasgupta 2021), and it shapes ecologically informed policies via the anthropocentric notion of ecosystem services (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES 2022). In economics, it is only challenged by so-called 'deep ecology' proponents in ecological economics (Spash 2013). The latter is primarily value-driven, whereas I will present an approach that argues within the logic of economics.

Consider the classical Coasean reasoning about the internalization of externalities, which has been closely associated with the ‘tragedy of the commons.’ The basic idea is that externalities can be dealt with by assigning property rights to a resource so that owners would be motivated to take care of it and make the best economic use of it: externalities would be subject to negotiations between owners, along the lines of legal procedures on nuisances (Serkin 2016). In the standard example of a factory polluting the river, the question is how rights to pollute or rights to clean water are allocated between various users of the river resource. However, this argument only includes humans as potential holders of rights. That means, for example, the interests of the fish living in the river are only considered indirectly via the interests of the fisherpeople catching fish. This is a speciesist position, as the fish are also affected by pollution but are excluded from the negotiation process. This is taken for granted; hence, the current solution is that the government might step in and protect the fish via regulatory interventions. So, we get a hybrid institutional framework of dealing with externalities in which only humans can hold rights on natural resources as owners; the interests of non-humans are represented by the government, that is, other humans.

As we know, this arrangement has wholly failed to stop the looming collapse of biodiversity on Earth. Hence, I suggest another solution: Assigning property rights to all living beings to launch a more-than-human process of internalizing externalities of human impact on planet Earth. How can that work?

3. Debunking anthropocentrism of rights of property

In recent years, the movement of giving rights to nature has gained speed, such as recognizing rivers as legal persons (Chapron, Epstein, and López-Bao 2019). Indeed, the construct of the legal person already creates a non-human holder of rights, such as the free-standing corporation. In principle, this can be directly applied to the rights of living beings. Further, the literature on animal rights has also unmasked the speciesism of the common assumption that non-humans cannot be holders of rights, such as human rights or ownership rights (Deckha 2021). Regarding human rights, the generalization is straightforward and has been classically argued by Peter Singer (Singer 2015). The key criterion is the capacity to suffer, that is, being sentient. To this, we can add the second key criterion: the capacity to act autonomously. Both requirements are not a matter of belief: Belief is only what denies those capacities to non-humans. Scientific evidence has extended the boundaries of sentience and autonomy far beyond what is considered ‘higher animals’ (Godfrey-Smith 2020). There is no scientific foundation for denying any ‘human’ rights to non-humans, based on the argument that those rights are coupled to distinct capacities exclusive to humans.

Apparently, the question of property rights is different; as Adam Smith famously quipped, we never saw two dogs bartering like humans. In economics, property rights are institutional devices to enact markets, and markets require distinct human means of communication and interaction. Even if we assign property rights to fish, they cannot negotiate with us. But does that justify denying their rights to ownership?

As Peter Singer argued fifty years ago, speciesism stands in line with racism and sexism. Denying ownership rights to other humans has been commonplace in all human societies, such as excluding women from holding land rights or treating colonized land as ‘terra nullius’, thus nullifying existing land use claims by native populations. The justification has always been that the respective

humans were of lower intellectual and moral capacities than the ruling groups, primarily white males. This argument is the same as applied to non-human animals today.

Let us consider a classical and influential theory on property, John Locke's. Locke conceives of the individual ownership of one's body as a natural right. Next, he argues that labor expended on an object creates ownership. Locke's theory provided legitimacy to the colonial expropriation of natives allegedly living as savages in the wilderness, literally like animals. Nobody owns the wilderness, and the tiller appropriates it with his labor. Of course, this application of Locke's theory is racist, but that points to the fact that it can be easily generalized: The natives also spent labor on the resources, even when they would gather nuts and herbs growing in the wild (Lucassen 2021). Apparently, the difference seems mainly technological, as a settler who tills the land is bound to it, whereas the nomad may follow herds of animals. Yet, this technological difference does not imply that the Lockean argument does not apply to the nomad. This was well recognized in the early history of colonialism, where colonial governments often moved to protect native rights against settler expropriation. They wanted to incorporate the natives as subjects in their realm (Greer 2017).

Now, and obviously, there is nothing that excludes non-humans from the original Lockean argument on ownership of the body since all living beings are defined by their capacity to distinguish themselves from their environment via enacting organismic boundaries and are autonomous in the sense of endogenously generating goals and actions (Thompson and Stapleton 2009). Denying the natural right to own themselves is speciesist. The philosopher Tilo Wesche has further generalized this reasoning in justifying the rights of nature (Wesche 2023). He introduces the distinction between natural resources and ecosystem services, approaching the latter as the processes that produce a natural resource, and that, therefore, can count as labor, understood in abstract form as 'adding value,' which is Lockean in spirit. This argument puts human property claims on the resource on par with claims of nature.

4. The Commons as a basic form of more-than-human property rights

The Lockean justification of property is universal and treats all living beings as potential property holders. To be more precise, this refers to their right of possession: In utilizing their environment as a resource, living beings possess the resource and accordingly establish rights to own it. This is a crucial step, as we must distinguish between possession as use and the derived right. This is well recognized in the economic theory of property rights, where the distinction between economic rights and legal rights is much-debated (Hodgson 2015; Barzel 2015). The former is a factual right to control and use; the latter is a right as defined by the law. This directly applies to the non-human extension: Possession is universal, and the question is how this translates into a legal right (Hadley 2015). Here we move into the exclusively human domain, as barring breakthroughs in communicating with animals, humans must independently take the step to formulating and assigning rights. How can this be done?

The solution has been adumbrated in Elinor Ostrom's celebrated work on the Commons (Ostrom 2015). Her original argument remains speciesist, as the members of the Commons are only humans who may negotiate over the fate of non-humans as a 'common pool' such as fisheries. This does not adequately reflect the complexity of ecosystems. Let us go back to Wesche's argument and consider an example of a natural resource, the soil, which is congenial to Locke's discussion of introducing property into the natural state.

Fertile soil may be produced by the farmer who tills the land, but many other living beings collaborate to create the soil. Consider the much-quoted earthworms: Their labor is essential for producing the soil. Hence we can differentiate between the soil as a resource and the ecosystem services that produce it. However, there are two difficulties. The first is that in an ecosystem, all constituents are resources for others. I refer to this as the principle of ecosystem holism. The other is that the sheer number of individual constituents is overwhelming. This results in what has been dubbed the 'tragedy of the anti-commons' (Heller 1998): It is impossible to create, assign, and manage all property rights theoretically corresponding to factual possessions, such as possession of earthworms.

So, on the one hand, we can recognize the complexity of mutual possessions in an ecosystem. Still, we cannot move to the simple Coasean solution of assigning individual property rights. The answer is the Commons, based on the distinction between property rights and ownership (Schlager and Ostrom 1992). In the original Ostrom model, the ultimate ownership right belongs to the community of the Commons. If we abrogate speciesism, we recognize this community as the ecosystem that relates to a critical resource, such as a lake or a particular area with topological boundaries reflected in ecosystem functionings (Herrmann-Pillath 2023). As in Ostrom's approach, this community can define and assign property rights to its members, which are specific rights of use but can never include alienation of the underlying key resource, such as selling land to non-members via the market.

In institutionalizing such a Commons, the concept of legal person applies in various forms. The first is that the Commons as the ecosystem is a legal person both with rights and responsibilities in its internal relation to members and in its external relations. The appropriate form is the trust, which is represented by trustees (Bradshaw 2020). For this, the current laws regulating trusts can be easily adapted. Internally, the Commons as trust needs to assign the status of right holders to various members. There is no universal solution to it; it is a design issue that seeks to create a workable, efficient, and inclusive regime of negotiating resource use in the Commons. As in the example of the soil, humans may obtain property rights by utilizing a parcel of land as personal holders of the right. However, earthworms may be represented as a group by a legal person who is in turn represented by a human steward. Hence, as far as the non-humans are concerned, the ecosystem Commons is a network of natural and legal persons which is institutionally designed by an internal process that reflects the ecosystem functionings. In principle, this distinguishes a constitutional level, in which the charter of the Commons would be crafted, and the post-constitutional level of continuously negotiating and adapting current institutions.

5. Transforming the technosphere: multi-species cohabitation in 'wild cities'

I do not go into further details (Herrmann-Pillath 2023). My primary aim is to show that in principle, we can employ well-known approaches in economics to overcome its inherited speciesism. Contrary to the standard Coasean approach to dealing with externalities, which excludes other species from partaking in the process of internalization, the Ostromian institutional form of the Commons enables and empowers inclusive internalization, effectively sharing resources among all members of an ecosystem while creating a system of partial property rights in exploiting its resources, allowing the necessary degrees of freedom for human economic action. In concluding this contribution, I offer a glimpse at what that means in practice.

Such Commons are already emerging, in the shape of recognizing rights of possession to all species cohabitating at a particular place, even when it comes to the vital manifestation of technosphere evolution, the modern city. The World Economic Forum has released a report on 'BiodiverCities by 2030' (World Economic Forum 2022). This slogan is also invoked by an EU-sponsored network of 13 cities pursuing the aim of enhancing biodiversity in cities (https://knowledge4policy.ec.europa.eu/projects-activities/biodivercities-project_en). The IUCN has launched an international benchmarking of multi-species urban environments (<https://www.iucnurbannatureindexes.org/en>). These initiatives respond to the recognition that cities are hotspots of biodiversity and evolutionary labs to future biodiversities that create ecosystem capacities to meet the challenge of climate change (Parris et al. 2018; C. D. Thomas 2020).

In practice, this means developing approaches to interspecies design in which the human-built environment is no longer only providing services to people but also to all other species (Roudavski 2021): hence we may speak of a reciprocal flow of ecosystem services for people and technosystem services for nature. Practically, this can be realized in the context of so-called 'nature-based solutions' (Herrmann-Pillath, Hiedanpää, and Soini 2022). For example, in the 'sponge city' design principles, urban wetlands and greeneries serve to cope with heavy rainfalls and regulate water flows in the city, which can also offer rich spaces for rewilding the city. This applies on all scales (Del Tredici 2014): For improving water drainage, the urban surface of roads and places must be porous, which allows herbaceous wild plants to flourish, if not suppressed, as usual, and this wild greenery also contributes to lowering temperatures. Examples abound.

Suppose we embed these approaches institutionally with the Commons as outlined here. In that case, this means that urban planning would recognize shared and partial property rights of non-humans in human-built structures, in principle, like rights of easement. Suppose the urban land is owned by all species cohabitating in a municipal Commons. In that case, human buildings must be designed as integral parts of the biosphere, allowing for uses by other species than humans. A simple example is birds (Hwang and Jain 2021). Modern buildings do not give many opportunities for birds to rest and nest. In comparison, a gothic-style building with many seemingly 'useless' ornaments, balconies, turrets, and so on is much more inviting. To this, green roofs and vertical greenery can be added. Such buildings open to rewilding are not fancy but are being constructed all over the world, yet remain exceptions. In the 'biophilic' city of the future, they would be the standard because this manifests the underlying property rights structure of the Commons.

Rewilding the city is the alternative to exclusively giving half of the Earth to non-human species. This is the better solution, as it does not separate the human domain from all others, akin to a giant technosphere condominium. Living together based on equal and inclusive ownership rights on the planet would create entirely new ways of living for the human species and would eventually allow for rich forms of symbiosis between technosphere and biosphere (Haraway 2016; Bridle 2022). A more-than-human science of economics will show the way for its institutional design.

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