

## ORIGINAL ARTICLE OPEN ACCESS

# The Earth System in the Anthropocene and the Primacy of Joint Collective Ownership

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**Received:** 25 January 2023 | **Revised:** 21 February 2025 | **Accepted:** 11 March 2025

**Funding:** The author acknowledges support from the research program *Ethics of Socially Disruptive Technologies*, which is funded through the Gravitation program of the Dutch Ministry of Education, Culture, and Science and the Netherlands Organization for Scientific Research (NWO grant number 024.004.031).

**Keywords:** Anthropocene | common ownership | global justice | joint ownership | natural resources

## 1 | Introduction: Rethinking Political Philosophy in the Anthropocene

When human beings began making claims to possess the ‘bounty of nature,’ the functioning of the Earth was physically independent of our species. That this is no longer the case is a profound and shocking development. According to the United Nations, human beings have “transformed the Earth’s natural systems, exceeding their capacity and disrupting their self-regulatory mechanisms, with irreversible consequences for global humanity” (United Nations 2022). Long noted by natural scientists, the extent of this transformation is often marked by the label ‘Anthropocene,’ i.e. the epoch characterized by human impacts upon the Earth (Crutzen 2002).<sup>1</sup> From a physical perspective, the Anthropocene signals a radical break with the past, “an entirely new, no-analogue state of the Earth system” (Kim 2021, 4).

Might the Anthropocene also represent a conceptual break with the past? At least in political philosophy, the question has gone largely unnoticed. As Chris Armstrong (2017) showed, much political philosophy conceives of the Earth and its benefits in roughly the same way as theorists from earlier centuries, namely as useful objects available in nature uncreated by human beings.<sup>2</sup> For instance, in Beitz’ (1975) influential account natural resources are useful objects lying under our feet, which brings to mind deposits of gold or oil. This intuitive view remains sufficiently widespread that the term ‘natural resource’ often goes undefined. Thus, cosmopolitans as well as their opponents use

the term synonymously with economic or material benefits (cf. Beitz 1975; Miller 2007; Moore 2012).

I believe that conceptual revision is required concerning the implicit object of such theorizing, namely *the Earth as a storehouse of natural resources*. As Mary Midgley already pointed out, this is the flawed ‘world-picture’ that political philosophy inherited from the social contract tradition, in which “the natural world existed only as a static background”, a mere “convenient stage for the human drama” (Midgley 2005, 350).<sup>3</sup> This picture has recently come under attack, with some arguing that the new realities of the Anthropocene require a reorientation of theory around the interconnections between human activity and planetary functioning (Jamieson and Di Paola 2016; Dryzek and Pickering 2019; Eckersley 2017).<sup>4</sup> Nonetheless, the intuitive conception of the Earth as a storehouse of resources remains largely intact in contemporary political philosophy, and in political thought more generally.

Without denying the importance of considering fair entitlements to natural resources, the aim of this article is to begin a more general re-evaluation of categories in political philosophy in light of the new realities of the Earth in the Anthropocene. To do so, my discussion returns to one of the oldest debates in political philosophy, namely the question of ‘world ownership’ that is the starting point for theories of territory and property. Principles of world ownership include *no ownership*, the view that there are no moral claims upon resources in the state of nature; *joint ownership*, the

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view that the collective preferences of all determine permissible resource use; and *common ownership*, the view that individuals have use rights in the state of nature, but no property rights.<sup>5</sup> A choice among these options is presupposed by all theories of distributive justice, since it must first be established that there are no justified ownership claims over resources before one can argue in favor of a particular pattern of redistribution.<sup>6</sup> By exploring the conception of the Earth found in this tradition, we can see how it may require rethinking.

Two recent accounts of common ownership provided by Risse (2012) and Blomfield (2019) have done much to render the debate about world ownership relevant for contemporary theorists. In critical dialogue with these accounts, I will advance two claims. First, that political philosophy ought to replace theorizing in relation to the Earth qua storehouse of resources with a picture of the Earth system in the Anthropocene, whose functional state is determined by human activities. Second, changing this object of theory will affect the plausibility of principles of justice meant to apply to it. I will argue that such a change supports a precautionary requirement ensuring the functional stability of the Earth system while reducing systemic risks, prior to the consideration of resource principles aimed at fairly sharing the benefits of natural resources. The reasoning that follows is situated in ideal theory, and thus abstracts from the complex problems of governance and feasibility that apply in the actual world. Nonetheless, by clarifying this goal in ideal theory, we will gain a clearer view of what justice requires in relation to the Earth system.

## 2 | The Earth System as the Object of World Ownership

Principles of world ownership concern the moral claims that people have to natural resources prior to property or territorial claims. The starting premises are that natural resources are not the products of human beings, and as such, no one has any prior claims to them. This establishes a basic equality in relation to natural resources, where each individual “originally has a claim to the world’s natural resources that is equal to that of everyone else” (Blomfield 2019, 52).<sup>7</sup> As Risse and Blomfield both recognize, these premises do not rule out alternatives to common ownership.<sup>8</sup> Thus, both utilize a global original position device to model the starting conditions of justice with respect to uncreated natural resources. The considerations that shape this original position also reveal the object of world ownership.

Consider Risse’s original position. Risse argues that common ownership would emerge from an original position in which deliberators knew that natural resources, which he calls “original resources and spaces”, are “valuable to and necessary for all human activities to unfold, the most important of which is to secure survival” (2012, 113; 121–22). Risse’s deliberators know that original resources and spaces are “materials that exist independently of human contributions (air, soil, raw materials such as minerals, coal, water)”, along with “how biophysical factors such as climate endow regions with value for humans” (2012, 108). What makes an object commonly owned is its status as having “come into existence without human interference” (2012, 114), which implies that it is not properly subject to special claims based on improvement or attachment.<sup>9</sup> Risse’s account is supposed to apply to the Earth

as a whole, which he describes as “a closed system of resources everybody needs for survival” (2012, 113). On this view, “what is originally owned is three-dimensional space of differential usefulness for human purposes, regardless of era-dependent economic relevance” (2012, 109).

It is striking that Risse does not think deliberators need to know anything about the risks of Earth system change, although they are supposed to be considering principles of world ownership. We will return to this issue shortly. First, there is a problem in trying to identify natural resources that are free from “human interference” or “human contributions”. This intuitive conception is inapplicable in the Anthropocene. Many relevant objects, such as the global carbon sink, terrestrial and aquatic biodiversity, land use, and so on, cannot be said to exist in a state unaffected by human activities. Indeed, very little of the Earth could be said to be free from human interference. According to one estimate, 77% of land and 87% of the oceans have been modified by human activity (Watson et al. 2018). Insisting upon causal independence from human activity will rule out far too much, aside from undiscovered mineral resources. Causal independence from human activities may imply that Risse’s common owners are not even entitled to forage or hunt to meet their basic needs. They would certainly not be entitled to make use of any of the products of agriculture, which as Marx pointed out long ago have “been filtered through previous labour” (Marx 1976 [1867], 285).

Blomfield’s account utilizes the more plausible resource conception provided by Armstrong (2017). Rather than defining the objects of common ownership as categorically separate from human action, this includes all entities as resources that belong to the natural world and that “individuals or collectives claim rights of jurisdiction or ownership over” (2019, 46). Something becomes a natural resource, on this view, once any individual or collective claims rights over it, whether explicitly or implicitly.<sup>10</sup> According to Armstrong’s conception, resources do not differ categorically from non-original artifacts but only due to the degree of anthropogenic influence exerted upon them. This allows one to hold that resources that have undergone some anthropogenic influence are still ‘unowned’ in the relevant sense, because no individual deserves moral credit for this influence (Armstrong 2017, 11; Blomfield 2019, 51, n. 19).<sup>11</sup>

Blomfield’s deliberators are also far better informed about the types of natural resources, and the factors affecting their availability. Blomfield’s deliberators are allowed to know:

- a. the variety of natural resource types and their respective uses,
- b. the fact that most of these uses of resources depends upon action coordinated with others,
- c. the fact that the distribution of resources across the Earth is uneven,
- d. that resources often require discovery,
- e. that knowledge and technology are often needed to utilize resources,
- f. that resources are scarce and can become scarcer due to human use, and

- g. that there may be biophysical limits to resource use, which may only become known in the future (2019, 93).

Of particular importance, Blomfield grants deliberators knowledge of *common pool resources* (CPRs), which are rivalrous, non-excludable and moderately scarce, unlike public goods such as oxygen which is non-rivalrous since one person's consumption does not diminish the consumption of others. A further implication of knowledge about CPRs is that any "act of appropriation may not affect anybody at the time, but it could yet have an impact on later arrivals, or be combined with other acts of appropriation in a process of accumulation that turns out to be morally problematic" (2019, 91).

While these features constitute a significant improvement, the context of the Anthropocene suggests that some important elements are missing. Blomfield's deliberators are not provided with adequate relevant scientific information about the Earth system, and its interconnections to human activity. Conditions (f) and (g) come closest: these provide knowledge about human-induced resource scarcities, and the possibility of "biophysical limits to resource use" that may not be known today. This already moves some way beyond the problematic world-picture noted at the outset, of an endlessly accruing bounty of nature. However, Blomfield's conditions leave out some of the most important insights about the functioning of the Earth as a system, or its characteristic risks. Correcting this is necessary before considering what principles of justice might be appropriate.

Arriving at a more realistic world picture requires understanding the results of Earth system science. Earth system science monitors the stability and resilience of the Earth system as a whole and the sub-systems that comprise it (Steffen et al. 2020). These open sub-systems cycle matter and energy between themselves, are interrelated in complex ways, and are responsive to positive and negative feedbacks, which settle at stable equilibria such as the Holocene conditions in which human beings first emerged as a distinct species. Much contemporary work in Earth system science concentrates on how human impacts are reaching critical thresholds or 'tipping points', separating one system equilibrium from another. The Anthropocene label registers that the present condition of the Earth system has been altered by the combined effects of human activity, shifting it from previous conditions into an unknown future state. Current trends put the Earth system on a trajectory that may not be compatible with the survival of humanity (Steffen et al. 2018).

The avoidance of tipping points is an important aim of the prominent 'planetary boundaries' framework (Rockström et al. 2009), which identifies a 'safe operating space' for humanity by identifying key biophysical processes that maintain the stability of the Earth system.<sup>12</sup> The planetary boundaries are intended to reflect a strongly precautionary stance upon Earth system change. The transgression of a planetary boundary does not imply that a biophysical tipping point has been crossed, because such boundaries are 'upstream' of tipping points (Steffen et al. 2015). The aim of this framework is therefore to provide a precautionary approach capable of anticipating dangerous Earth system change. The most recent assessment using this framework found that six of the nine planetary boundaries have now been crossed,

placing humanity in a zone of high risk of dangerous system change (Richardson et al. 2023; Rockström et al. 2021).

Based upon insights from Earth system science, what appears to be missing is something like the following:

- h. Human impacts upon the Earth system have accelerated exponentially following the Industrial Revolution and are now crossing several biophysical tipping points. This has pushed the Earth system out of its previous equilibrium (the Holocene) and is currently pushing it into a new state that may not support human societies or only in severely reduced numbers,
- i. Human impacts upon the Earth system as a whole, and upon its various sub-systems, are inadequately governed or regulated by existing resource regimes,
- j. Human activity determines both the availability and distribution of many natural resources and will continue to do so for the foreseeable future.

These conditions reflect widely supported findings in contemporary scientific literature on the Earth system and literature on global environmental governance.<sup>13</sup> Including them is justified by Rawls' insistence that public reasoning in the original position be supported by "the methods and conclusions of science when not controversial" (Rawls 2003, § 26.3). Thus, (h), (i) and (j) are relevant pieces of scientific information gained from Earth system science, which bear upon how human actions create and exacerbate systemic environmental risks. Conditions (h) and (i) seem particularly important, since they provide a scientific account of how the Anthropocene emerged (i.e., industrialization, economic growth, poor or absent governance). Without this, it is hard to regard our deliberators as suitably informed about the problem they are supposed to be considering. If these additional considerations are brought to bear, we will be theorizing about world ownership in relation to a different object, namely *the Earth system in the Anthropocene*.

If political theory were directed at this object rather than the traditional focus on natural resources, we would seem to face fundamentally new questions. As John Dryzek and Jonathan Pickering note, the Anthropocene "changes the content of ecological concerns by putting humans at the heart of causal processes in the Earth system" (2019, 5-6). Now, questions of justice would arise not in relation to a given set of planetary conditions, but in relation to an Earth system whose functional state depended upon and was fundamentally shaped by human activities. This also implies that questions of justice have become central even to functional descriptions of the Earth in the Anthropocene, since existing inequalities are drivers of current planetary conditions.

Although I have claimed that political philosophy has been slow to recognize this object as categorically different from the old world picture, there have been important precursors. One notable account is Tim Hayward's (2006) theory of 'ecological space' which already reflected a more holistic view of the Earth and the cycling of material flows, including the waste from resource use, modeled upon the ecological footprint concept (Wackernagel and Rees 1996). Ecological space aims to show that human

beings remain embedded in and fundamentally dependent upon ecological processes (2006, 359).<sup>14</sup>

Despite these similarities, there is a crucial difference in the scope of footprinting accounts, such as ecological space. Footprinting methodologies are aggregative, aiming to offer high-level comparisons between nations or per capita between individuals. The creators of the ecological footprint themselves view it primarily as an accounting tool for assessing whether resource use overshoots the sustainable limits of ecosystems (Ziegler 2007). While valuable for making comparisons, footprinting methods do not adequately capture the multi-dimensionality of interrelated causes and effects bearing upon the state of the Earth system; nor do they aim to do so.<sup>15</sup> Such a multi-dimensional view is precisely what we gain by means of casting discussion about justice in relation to the Earth system in the Anthropocene. This not only recognizes that the present use of available bio-productivity is highly unequal and unsustainable—an insight well captured in ecological space—but also that the current trajectory of the Earth system is dangerous for the survival of many forms of life, including our own. The fact that the Earth's functional state *has* a trajectory at all, rather than being fixed, is something new to reflect upon.

Nonetheless, broadening our conception of the object of theory is consistent with the primary aim of ecological space, which is ultimately not to make comparisons via aggregation, but to allow for “a particular way of seeing” (2017, 311) that highlights how human beings have come to dominate the biosphere. This is precisely the view that emerges in Earth system science: humanity has unintentionally become a geologically significant actor, without a sense of the magnitude of the risks attendant upon this change in status, or an understanding of the how to moderate its collective impact.

### 3 | Common Ownership in the Anthropocene

With this new object in hand, we can consider the normative arguments offered for common ownership. I will concentrate both on their internal plausibility and their plausibility in relation to the Earth system in the Anthropocene.

Risse's account (2012, 112) defends a right “either to use (in the narrow sense) resources and spaces to satisfy one's basic needs or else to live in a society that does not deny one the opportunity to satisfy one's basic needs in ways in which it otherwise could have been done through original resources and spaces”.<sup>16</sup> The Rawlsian fact of reasonable pluralism justifies pluralism about how natural resources matter to people, and this is supposed to prevent any stronger principle from emerging out of the original position (2012, 114).<sup>17</sup> Risse appeals to Doyal and Gough's (1991) theory of basic needs, but he is only concerned with a subset of the most fundamental needs in this account, namely physical health and the autonomy to deliberate. The thought is that these needs are sufficiently fundamental that there can be no disagreement about their normative priority (2012, 114; Blomfield 2019, 103).<sup>18</sup> However, as Blomfield recognizes, Risse's account is controversial because it only allows for claims to meet these minimal needs: “[p]arties to the hypothetical contract would recognise that distribution on the basis

of [Risse's] single principle might condemn those they represent [i.e. future generations] to a minimally acceptable existence”, in which they can only use natural resources insofar as these are necessary to support physical health and the autonomy to deliberate (2019, 105).

Risse's view is even more minimal in an intergenerational context. This is evident in his treatment of the sustainable use of natural resources. Risse claims that his view requires “a non-declining stock” of resources in order to recognize “intergenerational equality as a lower [ethical] boundary” (2012, 182). This implies that resource use ought not to cross critical thresholds which threaten basic needs (2012, 184). A further reason for this is the precautionary argument that natural systems provide “elementary life functions”, and do so better than conceivable replacements (184). As such, “there is a strong rationale for caution about depleting natural capital” (184). This seems to result in a fairly standard view of sustainability and intergenerational justice, in which the actions of the present do not undermine the needs of the future. However, Risse's own view is that future generations can only demand “reasonable conduct” but not justice from the present generation in their use of resources (2012, 185). Thus, Risse claims that “it would not now be unjust to exercise one's rights and help bring about a situation in which future people ought not reproduce, as they ought not if their offspring cannot sustain themselves” (2012, 184–85).

Such a view violates the interests in equality of parties to Risse's original position, which were meant to deliberate on behalf of themselves and their descendants. Many theorists would regard it as clearly unjust if the current generation used natural resources in such a way that they brought into existence a future so dire that future generations should not reproduce. Indeed, the standard interpretation of common ownership is that overusing what is commonly owned is unjust and amounts to theft.<sup>19</sup> What deliberators are after is a principle that protects their claims and those of their descendants in perpetuity, and thus that *prevents* such an intergenerational dilemma from occurring. Weakening the claims of future people is not a plausible rendering of such equality, notwithstanding reasonable pluralism.

Blomfield's more demanding conception of common ownership also justifies a use right in light of the moral priority of basic needs, but adds a system of sovereign resource rights which grant “every political community the entitlements over natural resources that are necessary for engaging in the legitimate exercise of collective self-determination” (2019, 114). Among relevant options are principles of *exclusive territorial resource sovereignty*, and of *presumptive resource sovereignty*. Blomfield argues that the former would be objectionable, while presumptive resource sovereignty would be regarded as necessary to support collective self-determination because such a right enables its holder to avoid being dominated by others (2019, 119–20).<sup>20</sup> The result allows for a higher level of basic needs satisfaction than Risse's minimalist use principle.

Even so, this combination of the use right and self-determination principles does not fully address the concerns that Blomfield's deliberators would be aware of. As we saw, her deliberators would know that it is necessary to change the status of such goods from open-access to managed CPRs to avoid a “tragedy of the commons”



in which each resource appropriator maximizes their harvest according to self-interest, ultimately destroying the ecological system producing the resource.<sup>21</sup> Because some CPRs are elements of the Earth system, they require ‘nested’ governance within jurisdictions *and* increased international governance (Ostrom 2010). If deliberators are genuinely informed about common pool resources and their governance, they can be expected to know this.

However, international governance of common pool resources, especially those that are elements of the Earth system, is not a requirement of justice on Blomfield’s view. Her view allows that self-determining groups may decide on prudential grounds to establish such governance, even to the point of “global jurisdiction” (2019, 136). Yet equally, they may not. Because global jurisdiction is not a requirement, failing to establish it would not be unjust. This means that suitably informed, equal deliberators would be morally satisfied with an outcome in which no shared jurisdiction over CPRs emerged.<sup>22</sup>

This result leaves the prospects of future generations overly subject to chance. Without some further governance being required as a matter of justice, globally significant environmental goods would be prone to overuse and depletion, creating threats of increasing severity for future generations. These threats are amplified if we consider how ungoverned resource use affects the functioning of the Earth system as a whole. As I argued in the last section, suitably informed deliberators would want to be certain that the principles they select would be sufficient to respond to Earth system risks. Yet the combination of the sovereignty and use right principles would not be up to the task, unless they were supplemented with some further principle requiring cooperation between self-determining agents.

Blomfield might respond that her self-determination principle includes a *presumptive* rather than an absolute right over the natural resources, and thus the threat of an abrogation of resource sovereignty for unsustainable use might avert unjust outcomes emerging with regard to global CPRs. There may be cases in which this response is sufficient, although it seems difficult to imagine the enforcement of a loss of resource sovereignty without establishing some form of global governance. Nonetheless, there is a structural problem with this kind of answer, namely that it is backward-looking and reactive rather than forward-looking and anticipatory. Environmental governance literatures such as on CPRs find that backward-looking governance regimes are insufficient to reduce systemic environmental risks and that anticipatory governance is required.<sup>23</sup> The overuse of CPRs is also typically gradual, as in the example of climate change, where individual actions to burn fossil fuels do not seem consequential on their own but accrue over time and in conjunction with the activities of many other agents and have a profound impact on the climate system. This makes it difficult to decide when an agent’s resource use constitutes a violation of presumptive sovereignty until a problem has emerged. Thus, all states’ resource use might be morally blameless at time  $t_1$  and thus would not violate presumptive sovereignty. Yet such a world could produce harmful scarcities in global CPRs at some future time  $t_2$ .

A more general issue is that Blomfield’s account, like that of Risse, remains directed at natural resources and only indirectly

considers the natural systems that provide them. This means there is insufficient attention to what might be required to adequately govern impacts upon the Earth system or the interdependence between its functional state and human activities. Humanity has unintentionally become a geologically significant actor, but that does not mean our collective influence upon the Earth system, including the causation of potentially catastrophic changes, must remain unintentional and unregulated. This is why the recommendation of some kind of global, even planetary stewardship is increasingly found in Earth system science (e.g., Steffen et al. 2018). This implies going beyond a world of self-determining agents, with no coordination of their activity required at the level of the Earth system. Although some of the dangers of the Anthropocene can be addressed through better governance of natural resources, focusing upon natural resources does not adequately capture Earth system risks, which are on a different conceptual level.

Note that this remains the case if one were to broaden the usual meaning of natural resources to ‘ecosystem services’ as Armstrong suggests (2017, 12, 15). Like the intuitive view of natural resources noted at the outset, ecosystem services also fail to capture important systemic elements of the Earth, even if this represents a clear improvement over intuitive definitions of resources. As Richard Norgaard (2010) argued, the metaphor of stocks and flows central to ecosystem services simplifies the complexity of ecosystem functioning to ensure compatibility with the dominant (equilibrium) economic approach to environmental management. Much of ecological science is incompatible with this stock-flow metaphor, defying characterization as inputs or services. Key components of the Earth system, such as the climate system or the biosphere, are imperfectly captured as ‘regulating services.’ More precisely, the Earth system, and its sub-systems, are prerequisites for stable ecosystems, rather than ‘services’ in the technical sense of being direct or indirect contributions to human well-being or economic activity.<sup>24</sup>

The discussion thus far has shown that these accounts of common ownership do not adequately respond to the threats posed by unsustainable resource use and fare worse in relation to the characteristic risks to Earth system functioning in the Anthropocene. In the next section, I will argue in favor of a form of collective jurisdiction aimed at managing these risks, based upon a rival principle of world ownership, namely joint collective ownership.

#### 4 | Joint Ownership of the Earth System

Let us ask whether deliberators in our original position would have reason to prefer the rival principle of joint collective ownership. Joint ownership is usually understood to mean that the collective preferences of all determine permissible resource use. According to Cohen (1995, 84), if something is jointly owned, “what each may do with it is subject to collective decision”. For Cohen, we can determine whether any appropriation is legitimate via “the democratic device of consensual agreement” (1995, 83). Cohen also claims that joint ownership confers upon everyone “a veto over [the external world’s] prospective use” (1995, 14). Objections against joint ownership have targeted the veto claim in particular. For instance, Blomfield (2019, 56)

claims that providing all individuals with a veto over resource use would be both “impracticable” and “implausibly restrictive”, leaving individuals with “no morally permissible control” over their lives. This criticism is persuasive, yet it assumes that joint ownership must apply to any use of resources whatsoever. It also implies that joint ownership must be understood as a resource principle.

The view of joint ownership advanced here builds upon the trust conception of joint ownership advanced by Brian Barry. Barry understood joint ownership to entail that “those alive at any time are custodians rather than owners of the planet, and ought to pass it on in at least no worse shape than they found it in” (1999, 258). However, the present view of joint ownership is limited only to the permissibility of activities that affect key Earth system functions. This avoids the criticism that joint ownership is overly restrictive, since it is here understood as a higher-order jurisdictional principle aimed at Earth system functions—functions which are responsible for the availability and distribution of many natural resources, and the cycling of wastes from resource use. These functions are not *themselves* considered as resources—i.e. instrumental goods capable of being substituted for others without loss (Kolers 2012). While this conception of joint ownership has implications for permissible resource use, this is only insofar as aggregate patterns of resource use affect the Earth system. Joint ownership, on this account, would not rule out *particular* acts of appropriation or use until they are approved by all. Instead, it grounds a shared obligation to reduce systemic risks to the Earth system as a whole, and its key sub-systems. This requires the establishment of effective global governance that protects the functioning of the Earth system, and seeks to return to the safety of near-Holocene conditions. Thus, this view of joint ownership retains the recognition of shared interests captured by the standard interpretation, but limits its scope to claims ranging over those essential elements of the Earth system that are necessary for the continued survival and prosperity of humanity.

We can now ask: would equal world owners agree to such a trust conception of joint ownership? This implies collective decision-making concerning the governance of Earth system functions, including agreeing to common rules that ensure the sustainability of natural resource use.

The argument in favor of joint ownership appeals to a strong notion of precaution, faced with catastrophic planetary risks now that we have left the safe conditions of the Holocene. As we saw in Section 3, a world without shared jurisdiction over at least some global environmental goods cannot prevent their depletion. This would consequently impose morally serious risks upon future generations. This relies upon a claim about the nature of Earth system risks that might be resisted. It is certain that the Earth’s sub-systems can change from one equilibrium to another as a result of crossing ‘tipping points’. However, there remains a great deal of uncertainty about when tipping points would be crossed, both within particular ecosystems, and at the higher level of Earth’s most important sub-systems, such as the climate system. There also remains considerable uncertainty about the reversibility of Earth system change. As such, one might worry that a strongly precautionary approach would only

be justifiable on a particularly pessimistic interpretation of the relevant probabilities of catastrophic outcomes.

There are two responses to this objection. First, there is an empirical question about the state of current evidence concerning tipping points. While considerable uncertainties remain, the most recent evidence suggests that tipping points are increasingly close to being eclipsed for several important Earth system functions (McKay et al. 2022). The causal mechanisms involved are known with certainty to exist from the geological record. Second, there is a conceptual point concerning the nature of such risks and the relevance of probabilities for strong precautionary responses. In response, Shue (2014, 264) has proposed that we are justified in ignoring probabilities entirely in situations where the following conditions hold:

1. There is the potential for massive, morally relevant loss,
2. There is a ‘threshold likelihood’ of massive losses occurring even in the absence of precise probabilities, when (a) “the mechanism by which the losses would occur is well-understood, and (b) the conditions for the functioning of the mechanism are accumulating”, and
3. The costs of precautionary action are not excessive.

According to Shue (2014, 264), “these three features jointly constitute a sufficient set for prompt and robust action to be required”.

The first two conditions are easily satisfied by the situation of the Anthropocene, in which (1) the potential losses are catastrophic, up to potentially endangering the survival of humanity; (2) the mechanisms that would result in such catastrophic losses are well understood in Earth system science, and it is well understood that the conditions required for tipping points to be triggered are accumulating, even if we lack precise probabilities. It is arguable whether (3) is so easily satisfied. The costs of avoiding the dangers of the Anthropocene may be great, since they seem to imply many changes to the global economy and to political institutions. However, Shue (2014, 46) intends (3) to concern *morally relevant* costs related to supporting basic needs or human rights, which may not be equivalent to economic costs.<sup>25</sup> As we saw in Section 2, the moral costs of an unregulated Anthropocene Earth system in which current patterns of resource use continued would be catastrophic. As a result, Shue’s three conditions apply. This supports taking a strongly precautionary approach to governing Earth system change.

Thus, deliberators would not be satisfied with any principle of world ownership that failed to prevent the catastrophic risks associated with Earth system change. Given that the Earth system is currently in a situation of instability and on a trajectory toward catastrophic change, and that human beings are the drivers of changes in its functioning, we require a principle that moderates our effects and aims to return to a less risky, stabilized Earth system.<sup>26</sup> Current risks weigh disproportionately upon future generations, who stand a successively greater chance (leading to a point of certainty) of facing catastrophic harms in the absence of concerted action by the current generation. Deliberators would favor a highly precautionary approach to global environmental governance, directly targeting the *only* planetary

conditions that we know for certain can support human society. Degrading these planetary conditions creates an unacceptable risk of undermining the well-being, even the survival, of future generations. Whatever else deliberators agreed upon in the original position, they would first agree upon a principle aiming for the stability of Earth system functions.<sup>27</sup>

As a trust conception, joint ownership registers that there are limits to the permissible exploitation of natural resources beyond which dangerous system changes can occur. Indeed, Cohen's discussion of joint ownership partly anticipated this point, noting the difference that an assumption of scarcity makes to world ownership. Commenting on Marx's mistaken assumption of inevitable future abundance, Cohen (1995, 16, emphasis added) wrote, "[o]ne might say that [resources] are owned in common, in the Lockean sense that all have liberty of access to them, or even that they are not owned at all, *since abundance means that no rules governing their use are required.*" Yet because inevitable abundance is a false assumption, rules governing their use are required.

The metaphor of the Earth as a trust entails that the Earth as a whole is usable by the current generation but held on behalf of future generations. The trust metaphor is strikingly absent in the accounts of common ownership considered earlier, despite its prominence in environmental governance generally and in scholarship on the legal principle of *Common Heritage of Mankind* in particular, which is grounded in the same natural law tradition (Baslar 1998). The reason for this omission is conceptually straightforward: a trust implies a stronger kind of shared ownership, while common ownership implies that the Earth as a whole is *unowned* (Risse 2012, 106).<sup>28</sup> Instead, if the Earth is held in trust, *something* is owned collectively in a positive sense.<sup>29</sup> That is, while the current generation hold 'title over the Earth and its natural resources, these are held on behalf of future generations.

There are several points of difference between Barry's trust conception and that advanced here. Barry's view holds that we ought to pass on a planet in at least as good a state as when we inherited it. This is now impossible. Even if human beings disappeared tomorrow, an ecologically impoverished and polluted planet would be left behind with many fewer species and intact ecosystems than merely two centuries ago. If current global emissions do not fall rapidly, the Earth is very likely to cross into a new and more dangerous state. As we have seen, such a change may be irreversible for thousands of years, notwithstanding human activities, and would not support human societies in anything like current numbers. There no longer appears to be any tenable notion of passing on the Earth in as good a condition as we found it, or more accurately, as our ancestors found it a few generations ago.<sup>30</sup>

Instead, joint ownership requires merely that the planetary conditions necessary for future generations to live decent lives are not undermined. Although Barry speaks of the planet as a whole as a trust, this takes place in the context of a debate about claims over natural resources. The broader context of the debate also involved responses to Rawls' just savings principle, which sets out what may appear to be a similar intergenerational constraint against overconsumption of resources by the present generation

(cf. Rawls 1999, §44: 251–258). However, there are important differences between the just savings principle and joint ownership of the Earth. As Stephen Gardiner (2011b, 144–45) has shown, Rawls' conception of the just savings principle applies to individual societies, making it inapplicable to problems of global intergenerational concern. And as Gardiner notes, even if this were addressed by extending the just savings principle to the global level, it would retain the problematic assumption that resource and capital accumulation must always increase. Yet intergenerational justice may actually require the present generation to reduce its absolute resource consumption. Second, all conceptions of the just savings principle remain focused on resources. On the present account, joint ownership is not primarily a resource principle, but a stability principle that responds to dangerous changes in the Earth system, whether or not these changes affect the use of resources (of course, they are often likely to do so). The trust held by the present on behalf of the future is not merely a stockpile of natural resources, but a range of benign planetary conditions supporting human and non-human life. Further, as I have argued, the intergenerational constraint imposed by joint ownership is incompatible with the assumption that resource use and consumption must increase indefinitely. Instead, joint ownership requires that the total anthropogenic impact upon the Earth system must rapidly *decrease*, in view of the catastrophic risks involved in continuing along this path.

There is also a further issue raised by the limitation to think in terms of natural resources, namely, if the Earth is held in trust, are human beings both the sole trustees and the sole beneficiaries? The replacement of the object of theory seems to be significant here: in moving from natural resources, which are by definition of instrumental value to *human beings*, to the Earth system, we may be less secure in the assumption that we are only dealing with instrumental values.<sup>31</sup> The question of where non-anthropocentric values might fit within a theory of justice requires far more discussion than can be provided here. However, note that Barry already concluded that a trust conception would ultimately involve moving beyond the sole consideration of human interests toward a new ethical relationship with the environment (1999, 257). Similarly, legal scholars of the *Common Heritage of Mankind* argue in support of it by means of the instrumental value of nature *and* nature's intrinsic value as reflected in various religious and philosophical traditions (Baslar 1998; Brown Weiss 1989; Taylor 1998). In contrast, most political philosophers have not followed Barry's suggestion.<sup>32</sup> For instance, Risse (2012, 114) and Blomfield (2019, 46–7) set non-anthropocentric values to one side when considering what justice requires.<sup>33</sup> A similar move is often made in discussions of climate justice (cf. McShane 2016; Dryzek and Pickering 2019, 64ff.).<sup>34</sup>

Whatever view we ultimately take on non-anthropocentric values within a theory of justice, there is no conceptual obstacle to recognizing such values within the trust conception I have defended here.<sup>35</sup> If we were to take a broader perspective on the Earth that included non-anthropocentric values, we might conclude that it is both the home of humanity and of all other known forms of life. We might also conclude that the Earth system does not belong to humanity, as a simple object might, but that we belong to it. This would imply that the strongly precautionary approach required by joint ownership would not be limited to human interests. Instead,



we should say that each generation owns the Earth not as sole occupants but as temporary custodians, and we would pass it on not only to our descendants but to other forms of life who share it with us.

## 5 | Conclusion

This discussion of world ownership has shown how the implications of the Anthropocene can significantly reframe reflection upon global justice and natural resources. I argued that contemporary accounts of common ownership do not adequately respond to the threats posed by unsustainable resource use, nor the characteristic risks to Earth system functioning. Instead, I have argued in favor of a form of collective jurisdiction aimed at managing these risks, based upon an interpretation of the principle of joint collective ownership. If this argument is correct, it challenges the long-held orthodoxy regarding the plausibility of common ownership in response to a world featuring unowned but valuable resources. Even if this were granted in relation to an Earth that functioned independently of human activities, it ceases to be so in relation to the Anthropocene Earth, whose functional condition now depends on us.

## Acknowledgments

I wish to thank Clare Heyward, Fabian Schuppert, Kian Mintz-Woo, Michel Bourban, Bennet Francis, Elisa Paiusco, and my anonymous reviewers for helpful comments on an earlier draft.

## Conflicts of Interest

The author declares no conflicts of interest.

## Endnotes

<sup>1</sup> My use of the Anthropocene follows that found in much contemporary scientific work analyzing the effects of human activities upon the Earth's natural systems and processes. I note that there has been a long-running, but ultimately unsuccessful attempt to reclassify the current geological epoch as the Anthropocene, beginning from 1952. The International Union of Geological Sciences rejected this proposal citing the concern that most geological designations span thousands or millions of years. Nonetheless, this terminology remains useful in describing the extent of anthropogenic impacts now observable.

See <https://www.theguardian.com/science/2024/mar/22/geologists-reject-declaration-of-anthropocene-epoch>.

<sup>2</sup> Armstrong (2017, 94-5) recognizes that if human beings have become planet-shaping forces in the Anthropocene, we can no longer speak of resources as independently there.

<sup>3</sup> Midgley raises this 'world-picture' to discuss James Lovelock's Gaia conception of the Earth. For discussion of the links between Gaia theory and Earth system science, see Lenton et al. (2020).

<sup>4</sup> Dryzek and Pickering (2019) propose reorienting political theory in relation to the Earth system as 'planetary justice', rather than global justice. To date, this new terminology remains unfamiliar in political philosophy. See Hickey and Robeyns (2020) for discussion of the challenges facing any such move.

<sup>5</sup> In contemporary governance, the principle of common ownership bears some relation to legal principles that recognize common interests in environmental goods such as the *Common Heritage of Mankind* and *Common Concern of Humanity*. See Baslar (1998).

<sup>6</sup> The core difficulty, which may now be most associated with Locke, is that because natural resources are uncreated by human beings (and hence 'natural'), all have an equal claim upon them. If so, it is unclear how private ownership over resources could be justly acquired.

<sup>7</sup> *Originality* is key to these claims, which are independent of when or where anyone is born, including future generations; lexically prior to claims formed on the basis of relations between individuals and resources; and concern resources that were uncreated by human beings (Blomfield 2019, 52; Risse 2012, 108).

<sup>8</sup> In traditional accounts, such as those of Aquinas and Locke, the claim that all people have the natural right to use resources depends upon the theological premise that God created the Earth and gave it equally to humanity.

<sup>9</sup> Risse (p. 109) writes that "what is originally owned is three-dimensional space of differential usefulness for human purposes, regardless of era-dependent economic relevance."

<sup>10</sup> This formulation addresses another concern with Risse's account, namely that it does not respect different descriptions of nature as a resource. See Kolers (2012).

<sup>11</sup> Blomfield endorses Armstrong's definition of resources as "raw materials... comprising both matter and energy" (2017, 27, n. 3).

<sup>12</sup> The nine key boundaries are biosphere integrity (comprising functional and genetic diversity), climate change, novel entities (new substances or modified life forms introduced to the environment), stratospheric ozone depletion, atmospheric aerosol loading, ocean acidification, biochemical flows (especially phosphorous and nitrogen), freshwater use, and land-system change.

<sup>13</sup> For an overview of the latest scientific evidence on the Earth system, planetary boundaries, and tipping elements, see Richardson et al. (2023); Rockström et al. (2021); McKay et al. (2022). For analysis of the shortcomings of existing environmental governance, see Rockström et al. (2024); Dryzek and Pickering (2019); Biermann (2014); Galaz (2014); Kotzé (2014). The link between CO<sub>2</sub> emissions and economic growth is historically well-established and reflected in many IPCC reports. The link between biodiversity loss and economic growth is similarly well-established. See Dasgupta (2021); Otero et al. (2020).

<sup>14</sup> This reflects the influence of ecological economics, particularly the seminal theory of Nicholas Georgescu-Roegen (1971), which examined the interdependence of resource use and waste production on the basis of the first and second laws of thermodynamics.

<sup>15</sup> While Hayward has indicated openness to multiple measures within an improved conception of ecological space (cf. Ziegler 2007, 123, n. 28), moving towards a multi-dimensional view of humanity's impact on the biosphere may dissolve the unitary metaphor of 'space' (2007, 124).

<sup>16</sup> Risse clarifies that the kind of claim being advanced by common ownership as Hohfeldian liberty, claim, and immunity rights for individuals to make use of natural resources. These include direct use rights (liberty and claim rights) to use natural resources to meet basic human needs, and/or indirect immunity rights, which require that institutions governing natural resources must not deny common owners the ability to meet their basic needs (2012, 112).

<sup>17</sup> Risse writes that "[a]s reasonable persons can reject stronger claims in support of collective ownership, they can also reject stronger conceptions of it. So no stronger conception delivers natural rights (rights every reasonable person should accept)" (2012, 122).

<sup>18</sup> As a non-relational claim of justice, Risse's need-targeting use right takes normative priority over any subsequent rights derived from private property (2012, 115).

<sup>19</sup> Thus Aquinas writes "When Ambrose says: 'Let no man call his own that which is common', he is speaking of ownership with regard to use. Hence he adds: 'He who spends too much is a robber'". Aquinas (2002), *Summa Theologiae* IIaIIae 66, ad 3.



- <sup>20</sup> Since Blomfield argues that the same method for selecting the basic needs principle would also select the self-determination principle, I take them to jointly constitute her account of common ownership.
- <sup>21</sup> They would also know that appropriate governance must deal effectively with “threats of overuse and of free-riding” (Dolšák and Ostrom 2003, 8).
- <sup>22</sup> It is possible to justify some form of shared resource sovereignty on the basis of self-determination, and Blomfield appeals to self-determination to justify her territorial sovereignty principle. For such an argument, see Nine (2014). Thus, Blomfield’s account could be expanded to include the sort of collective sovereignty claim mentioned here as a requirement of justice as common ownership. Such a move would be close to the view I defend in this paper. Nonetheless, it would still respond to a conception of the Earth as a source of valuable natural resources, which remains Blomfield’s view, rather than to the Earth system.
- <sup>23</sup> See note 13 above.
- <sup>24</sup> Ecosystem services are grouped into provisioning services (e.g., food, water, raw materials), regulating services (e.g., climate regulation, pollination), habitat services (e.g., maintenance of genetic diversity), and cultural services (e.g., recreation and tourism, aesthetic value, or spiritual experience). See TEEB (2010).
- <sup>25</sup> Hartzell-Nichols (2017) utilizes Shue’s conditions to devise a “catastrophic precautionary principle” for climate change.
- <sup>26</sup> I follow Steffen et al. (2018) in understanding ‘stability’ in relation to an Earth system whose trajectory as a whole gradually returns towards the trajectory it would have taken in the Holocene if industrialization had never occurred. This does not mean a literal return to the conditions of the Holocene, which as Dryzek and Pickering note is impossible because “the condition of the system is continually moving”, and therefore “We cannot rewind ecosystems back to a state untouched by humans” (2019, 9).
- <sup>27</sup> This conclusion accords with Armstrong’s (2017, 243–44) suggestion that, while unlikely, it would be desirable on egalitarian grounds to move towards some form of transnational resource management.
- <sup>28</sup> This position is famously characterized by Pufendorf as ‘negative communion’. See Samuel Pufendorf, *De Jure Naturae et Gentium Libri* Octo 4.4.1–9.
- <sup>29</sup> The sense in question, as in accounts of environmental trusteeship, is that of a public trust, which should not be equated to trusts in private property law. See Sand (2014).
- <sup>30</sup> Since it is no longer possible to pass on a planet in as good condition, questions of compensation arise. While I cannot consider this issue in any detail here, compensation might take the form of global wealth fund along the lines advocated by Hillel Steiner (2011). Yet unlike Steiner’s fund, this could not be made fully available to any single generation, as this would violate the equal claims of future generations as trustees.
- <sup>31</sup> I thank an anonymous reviewer for this point.
- <sup>32</sup> Hayward (2017) is a notable exception here, as the concept of ecological space makes room for a reorientation of human-nature relations beyond the standard frame of instrumental use.
- <sup>33</sup> The reasoning for this move is unconvincing. Risse provides an argument for the universal prioritization of human interests, citing Bernard Williams’ conception of “enlightened anthropocentrism”, which is roughly the view that all values are values from a human point of view. This, however, is a misinterpretation, as Williams actually undermines such a view, writing: “To see the world from a human point of view is not an absurd thing to do. It is sometimes said that such a view implies that we regard human beings as the most important or valuable creatures in the universe. *This would be an absurd thing to do, but it is not implied.* To suppose that it is, is to make the mistake of identifying the point of view of the universe and the human point of view” (2006, 131, emphasis added).

- <sup>34</sup> This may be a question of emphasis rather than of principle, as theorists of climate ethics have indeed highlighted the moral significance of non-human nature (e.g., Jamieson 2010; Gardiner 2011a). My thanks to Stephen Gardiner for discussion of this point.
- <sup>35</sup> A non-anthropocentric trust principle is already available in Prue Taylor’s “common heritage of life” principle, which she argues should supersede the *Common Heritage* and to apply to the entire biosphere. Taylor defines this as follows: “The earth’s biosphere is the common heritage of all life on earth, of which humanity is the steward” (1998, 297–98).

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