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ORIGINAL PAPER

# Territorial Rights and Carbon Sinks

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**Abstract** Scholars concerned with abuses of the "resource privilege" by the governments of developing states sometimes call for national sovereignty over the natural resources that lie within its borders. While such claims may resist a key driver of the "resource curse" when applied to mineral resources in the ground, and are often recognized as among a people's territorial rights, their implications differ in the context of climate change, where they are invoked on behalf of a right to extract and combust fossil fuels that is set in opposition to global climate change mitigation imperatives. Moreover, granting full national sovereignty over territorial carbon sinks may conflict with commitments to equity in the sharing of national mitigation burdens, since much of the planet's carbon sink capacity lies within territorial borders to which peoples have widely disparate access. In this paper, I shall explore this tension between a global justice principle that is often applied to mineral resources and its tension with contrary principles that are often applied to carbon sink access, developing an analysis that seeks to reconcile what would otherwise appear to be fundamentally incompatible aims.

**Keywords** Territorial rights · Carbon sinks · Climate justice · Emissions rights · Permanent sovereignty · Carbon budgets

Who owns the world's carbon sinks, and what does such ownership entail for how owners may use and dispose of this ecological capacity and more broadly how the international community responds to anthropogenic climate change? If property

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rights in carbon sinks confer use rights upon their capacities to sequester carbon dioxide ($CO_2$), then they create entitlements to emit this greenhouse gas without contributing to climate change or incurring international remedial burdens for having done so. Sink owners would thus be entitled to use the full capacity of their sinks, claiming them as exemptions from climate change mitigation imperatives, and either transferring unused emissions entitlements through markets in carbon offsets or claiming compensation for sink capacity appropriated by others without permission. Since natural carbon sinks are typically comprised of forests, grasslands and other terrestrial systems in which plants absorb $CO_2$ and retain it as biomass, the question of their ownership may appear to resolve to their territorial location, with the ownership of sink capacity (an ecological service generated from biomass resource stocks like forests) coinciding with ownership of the resource stock itself: those that own the trees also own the sinks. Including carbon sink ownership among the set of territorial rights in this manner, as the conventional principle of international law for settling resource ownership questions recommends, jeopardizes climate change mitigation efforts and undermines imperatives for equitable mitigation burden-sharing among states.

But the question of carbon sink ownership is vexing for several reasons. First, while the majority of terrestrial carbon sinks reside within the territories of states in the form of forests or other biomass, about 40% of such sinks reside in the earth's oceans, to which states have no territorial ownership claims. This sink capacity lies within the global commons, but requires some restriction on access if commons tragedies are to be avoided, and for reasons to be further considered below ought to be subjected to justice principles in its allocation. Second, while sink capacity is found within forests and other biomass, it involves a flow resource that is in principle detachable from the resource stock in assigning property rights, even as the two physically coincide and differentiated rights schemes for each have yet to be developed. Because these involve distinct aspects of property ownership claims, one can own the land on which the trees grow, and even hold extractive rights to the timber, but not be entitled to the sink capacity that forests generate. Linking ownership of a stock resource and its flow capacity requires some kind of justification, keeping in mind the possibility that decoupling these separate aspects of resource rights might be more justified. Finally, ownership of carbon sink capacity is vexing in that it involves a fully fungible good in which physical access is impossible to restrict, so any restrictions on access are purely notional and based upon allocations of use rights. At issue are rights to use sink services, which confer permissions to emit $CO_2$: rights that must be limited if climate change mitigation goals are to be met and equitably allocated if climate justice imperatives on mitigation burden sharing are to be realized. Since access to particular sinks cannot be restricted, sink ownership entails the entitlement to carbon emissions in the quantity of that sink's sequestration capacity, not exclusive access to any particular sink. The question of carbon sink ownership is therefore necessarily bound up in climate justice issues of how much parties might be allowed to emit under equitable international mitigation targets.

As the world moves toward the commodification of carbon sinks, questions about their ownership become increasingly important. The assignment of property rights

in terrestrial carbon sinks will shape international mitigation efforts, and could constrain or even undermine the equitable allocation of emission rights, which many view as an essential component of climate justice imperatives as well as a politically feasible global climate treaty (Vanderheiden 2008). Given the currently unsettled nature of such rights, along with an apparent conflict between climate justice imperatives and an international legal principle discussed below, the critical analysis of equity dimensions of their construction and definition seems warranted.

Here, I shall consider the question of carbon sink ownership in light of a key principle of international law, its basis in theories of territorial rights, and its normative foundation in concern for global justice and development, arguing for an interpretation of that principle that allows for the division of different aspects of sink ownership rights that reflects these foundations while enabling other global justice imperatives, and thus better informs the property right issues inherent in the commodification of carbon sinks or sink capacity. Appealing to both attachment and improvement theories of territorial rights, and in the context of climate justice imperatives that require ambitious mitigation efforts with equitably allocated national emissions entitlements, I shall argue for a view of sovereignty over territorial resources that contains an account of how to assign rights to carbon sinks that maintains the integrity of this principle of international law while accommodating those imperatives. Situating carbon sinks partly within and partly beyond territorial resource rights claims, I defend an allocation of rights to carbon sink services that is normatively defensible and practically efficacious, allowing peoples an equitable share of the planet's carbon sequestration services while also providing states and peoples with incentives to sustainably manage or enhance their territorial sinks in their climate change mitigation efforts.

## Permanent Sovereignty and Carbon Sinks

A starting point for the critical analysis of rights to carbon sinks is a key principle of international law that was originally developed to protect peoples and resources from colonial exploitation, and which has been frequently invoked as a constraint upon efforts at international cooperation in managing the global environment. The *permanent sovereignty* principle, which was first articulated with UN General Assembly Resolution 1803 in 1962 and reaffirmed in Common Article 1 of the Covenant on Civil and Political Rights (CCPR) and Covenant on Economic, Social and Cultural Rights (CESCR) four years later, assigns natural resource rights to the peoples within the territory in which those resources are located, rather than allowing wealth from these resources to be transferred by states to foreign interests with no benefits from the extraction and sale of their resources accruing to the people. Resolution 1803 notes that such resource rights are to be "exercised in the interest of their national development and the well-being of the people of the state concerned," which as Article 47 of CCPR and Article 25 of CESCR states entails the right to "utilize fully and freely their natural wealth and resources."

Developed in response to patterns of resource exploitation by which residents of resource rich developing countries saw little or no benefit from the extraction and

export of natural resources by foreign states and multinational corporations, permanent sovereignty seeks to ensure some public benefit from private resource extraction and depletion, granting management authority over territorial resources to states with the explicit charge that these be exercised in a manner that benefits the people. Under this principle, states could transfer ownership or use rights over some territorial resources so long as this provided some benefit for local people, understood in terms of advancing economic and political self-determination (Schrijver 1997). As applied to carbon sinks, the principle would seem to allow states to sell use rights to their territorial carbon sinks through international carbon markets or in private carbon offset markets, so long as some share of the revenues derived from such sales were dedicated to advancing the development or welfare interests of the territory's people.

Legal property rights contain various aspects, not all of which are necessarily assigned to the same party for a given parcel of property, allowing for division in both theory and practice. As applied to carbon sinks, rights of *possession* involve legal title to the land and stock resources (e.g. timber) that yield the flow service of sink capacity; rights of *control* determine how that property may be used and may include limitations upon extractive use; rights of *exclusion* allow other users to be denied access to it; rights of *enjoyment* allow holders of the right to use and benefit by the property in any legal manner, while rights of *disposition* allow the holder to buy or sell the property. Standard property rights to forested land in market economies separate possession, which can be assigned to private timber land owners, from control, which is assigned to the state, prohibiting some uses and regulating others. Rights of exclusion can be limited even where other users can be readily physically excluded from using the property, as when public rights of way prohibit landowners from closing existing roads or trails, and rights of enjoyment by private landowners can also be restricted, as when they are prohibited from damaging neighboring properties by obstructing or otherwise damaging aesthetic features of other properties like views, or when laws like the US Endangered Species Act prohibit development upon privately-owned land when this leads to critical habitat loss for endangered species.

These aspects of carbon sink ownership might likewise be divisible among parties, with each aspect requiring its own justification for being bundled together with others. Permanent sovereignty claims a partial right of enjoyment and sometimes also a limited right to disposition for territorial natural resources that are depleted upon extraction and use. Decisions to develop such resources may need to be made in a democratic manner (Pogge 2008), or may be a prerogative held by states with sufficient Freedom House scores (Wenar 2008) if made without popular consultation, but both follow the rationale for requiring that a share of the benefits from territorial resource extraction accrue to the people found in Resolution 1803. While modification to existing rights of possession and exclusion has not been proposed within the justice literature, other than this provision related to shared enjoyment, critics of carbon trading have bemoaned the "accumulation by decarbonization" (Bumpus and Liverman 2008) through which poor states are dispossessed of lands through reforestation projects, implicitly endorsing constraints upon rights of disposition, as well. In further refining the principle in its application

to carbon sink ownership, which involves a resource that is finite but not depleted with use as those fossil fuel resources that have primarily shaped resource right theories are, rights of exclusion and enjoyment might further be modified to allow non-residents some access to territorial sinks, which can absorb $CO_2$ that was emitted outside of national borders. Similarly, rights of control might add additional restrictions that limit conventional enjoyment rights, such as usufructuary rights that prohibit the destruction of certain environmental goods (Wolf 1995) or incentivize their enhancement, as well as carbon production constraints designed to mitigate climate change, as shall be discussed below. But my primary task in this section lies in decoupling possession rights to the stock resources from which sink capacity is yielded and enjoyment rights to those flows, which would require development of a view of territorial resource rights that attached to the former without attaching to the latter.

However they are defined, property rights in carbon sinks are needed for establishing carbon offset markets and as foundations to domestic and international emissions trading systems that are viewed as cornerstones of cooperative efforts to mitigation climate change. In allowing for the sort of property rights in carbon sinks necessary for carbon offset markets to function, and in emphasizing that revenues derived from the enhancement or transfer of sequestration capacity and thus emissions rights be used to advance the welfare interests of local people, permanent sovereignty serves the objectives of international climate change mitigation efforts that view markets in sink capacity as promoting sustainable development. Insofar as developing countries with carbon sink capacity in excess of their greenhouse gas emissions can benefit their resident peoples through the transfer of use rights to that excess capacity, and so long as this does not inhibit their development interests or undermine their subsistence rights, vesting sovereignty over this particular resource in the states or peoples of such countries would seem to promote rather than conflicting with one key objective of climate justice, which is for the climate regime to narrow rather than widening existing inequalities among and between peoples. As shall be further explored below, however, granting territorial rights to carbon sinks would widen rather than narrow inequality when developed states have territorial sinks in excess of their current emissions or developing ones have emissions in excess of their sink capacities.

While serving mitigation imperatives by supporting carbon trading systems through rights of control and disposition that allow states to profit from reforestation projects that enhance sink capacity and trade their unused emissions entitlements on international markets, the permanent sovereignty principle also threatens two climate justice objectives: to prevent dangerous climate change for the benefit of current and future generations, and to allocate either emissions rights or remedial burdens associated with climate change mitigation in a manner that is equitable and on the basis of the "common but differentiated responsibilities and respective capabilities" of various nation-state parties. Insofar as it grants to states or peoples the right to exploit their territorial resources rather than requiring them to conserve some quantity of those resources, subject only to the principle of mutual benefit applied to the buyers and sellers of such rights, permanent sovereignty undermines international carbon abatement objectives associated with climate change

mitigation, since these require limits on both global carbon production and consumption. And insofar as it grants use rights to carbon sinks to the people in whose territory they are located in the first instance, to be transferred to others only through sales or trade in their use rights, it undermines the egalitarian resource-sharing commitments articulated by climate justice scholars and expressed within climate justice movements.

## Territorial Right Theories and Carbon Sink Entitlements

In revising and updating the permanent sovereignty principle to reflect current climate justice imperatives, such pragmatic considerations can inform the evolution of the principle, but so also can the normative bases for any claim to territorial natural resources, which are an aspect of territorial rights theories that are also concerned with rights of jurisdiction and border control. Territorial rights theories are instructive for considering how to revise the permanent sovereignty principle, or indeed whether carbon sinks should be bound by it at all or assigned to the global commons, given their foundational focus upon the normative basis for any such territorial rights claim. Such theories can be grouped into two major categories of approaches: those based in improvement and attachment. Improvement theories are typically Lockean, claiming rights to territorial resources on the basis of value added through historical labor. As Miller summarizes this justification for territorial resource rights, "groups are entitled to keep and enjoy the value they have created historically" (2012, p. 259). Insofar as a people is responsible for maintaining or enhancing the value of some resources, which following Locke are assumed to lack value prior to their having been improved, they acquire rights to those resources or that added value to which their investment of labor contributed.

From this account, the shortcomings of improvement theories as applied to mineral resources in the ground or unimproved carbon sinks are clear. As Armstrong notes, "some resources will be undiscovered and it is hard to see how any direct special claims could apply to them," while "others will lie dormant and will not have been improved in any significant sense" (2014a, p. 6). Whereas territorial rights to *enhanced* carbon sink capacity may be justified on the basis of improvement theories (Armstrong 2014b), given the need for costly investment in reforestation efforts or other activities designed to expand absorptive capacity, it cannot plausibly serve as justification for awarding people rights to emit merely because they were fortunate enough to be born into low density and heavily forested countries like Canada and Russia, and have not yet denuded those forests. Likewise, mineral resources are not so much improved upon extraction as they are simply moved from a less portable condition to one in which they can more readily be brought to market. While oil is refined, which constitutes a kind of improvement, that refining can take place in a second country without that non-originating people acquiring post hoc rights to those resources, and contrary to Locke's assumption this adds only some value to a resource that was already valuable as crude oil, prior to any improvement.

Attachment theories trade on the idea that "character of the people—for instance, their dwellings, cuisine, and eventually social relations and kinship patterns develop over time due to features of their environment such as climate, soil, and so on" (Kolers 2009, p. 132), from which a right to continued access arises, as necessary for maintaining that culture. Note that, for Kolers, such an attachment-based right claim can apply to a resource token, like a particular forest, but not to a resource kind, or a "fungible means" that is "replaceable by other means to the same end, or convertible without loss into money" (2012, p. 278). Evidence for treatment of some resource as a fungible means includes "action "that commodifies the resource," such as participating "in a transnational commodity market for that particular phenomenon" (p. 281). According to this account, neither carbon sinks nor mineral resources like coal or oil could be assigned to the people of the territory in which they originate, since both are commodities and these are not the sort of resources around which durable cultural attachment forms.

Thus far, theories of territorial rights do not appear to generate useful bases for assigning resource rights to carbon sinks or emissions absorptive capacity. On the one hand, they appear capable of justifying claims to particular forests in their stock capacity, if not to their flow resources in carbon sink capacity, as well as to the enhanced sink capacity within a territory, if not its latent capacity prior to any such improvement. On the other hand, standard bases for territorial rights offer little justification for assigning ownership to mineral resources in the ground, which are another kind of stock but one that *qua* resource is invisible prior to extraction and thus not a fitting object of popular attachment, or to unimproved sinks.

Appealing to territorial rights theory, then, may seem to equivocate on ownership of the forests that serve as stock resources (or natural capital) but also generate flows, as it also does in granting states or peoples no rights to territorial mineral resources in the ground, but allows for some ownership upon their extraction and refinement into commodities, through which process they improved and so increase in economic value. But it also offers a key insight, which is that resource rights might be divisible by function within a singular natural entity like a forest, in which as Armstrong notes, one's "ability to live in a rainforest unmolested is compatible with granting outsiders the right to emit greenhouse gases, and hence sharing that rainforest's absorptive capacity" (2014b, p. 58). Forests can be objects of territorial rights in their stock capacity, as well as with yields of some flow goods that depend heavily upon conservation management, like timber, but also yield resources that defy such territorial right claims, and so could be subject to egalitarian reallocation without violating entitlement claims.

Territorial sink capacity might likewise be differentiated between that which is merely latent and unintentionally preserved by not being more degraded by human activities and that which has been deliberately expanded or enhanced. States or people could be awarded rights to the latter on the basis of improvement theories, since these result from investments in ecosystem services that would not be made without some return for the investors, whereas the former could be treated differently, with use rights to this sink capacity available for egalitarian assignment of emissions rights regardless of territorial residence. These distinctions mirror those found within international law and policy, in which severance taxes from

logging territorial forests accrue to the state in which those timber harvests take place, and where reforestation programs under REDD likewise confer a property right to carbon sink capacity rather than simply adding this capacity to the commons, but merely having high per capita carbon sink capacity within a territory's borders is not seen as excusing it from taking on carbon abatement commitments comparable to similarly developed countries that lack such abundant sinks. More importantly, they serve the demands of climate justice, which requires that sink capacity or carbon emissions entitlements be available to allocate on an equitable basis, rather than being assigned exclusively to states in whose borders those sinks reside, while also providing an incentive for sustainable management of territorial carbon sinks by crediting states or other parties with sinks that they protect or enhance along with penalizing them for sinks the allow to become degraded. This distinction grants territorial resource rights to carbon sinks on the basis of improvement, then, while allowing access to latent or unimproved sinks to be equitably allocated without regard to the territorial location of such sinks, and while maintaining the stock forest resources from which this flow sink capacity is yielded to remain within conventional territorial resource rights, on the basis of attachment theories (as sink capacity, but not forests themselves, are fungible means).

## Carbon Production Budgets, Sinks, and Property Rights

Attention to climate change mitigation imperatives along with those surrounding the equitable allocation of carbon emissions rights requires attention to carbon production as well as its consumption, with constraints on both running afoul of the strong version of sovereignty over territorial resources but compatible with the weaker interpretation articulated above. As steadily increasing rates of atmospheric $CO_2$ and the increasing global average temperatures indicate, the planet's terrestrial carbon sinks cannot absorb and store the quantities of carbon now being emitted. Absent the development and widespread deployment of artificial carbon sequestration technologies like carbon capture and storage, significant amounts of known fossil fuel reserves will have to remain undeveloped if current global temperature targets are to be met. According to the Climate Council of Australia (2015):

> To have just a 50:50 chance of preventing a 2 °C rise in global temperature: 88% of global coal reserves, 52% of gas reserves and 35 % of oil reserves are unburnable and must be left in the ground. Put simply, tackling climate change requires that most of the world's fossil fuels be left in the ground, unburned.

While the climate justice imperatives associated with limiting climate change require that much of these resources remain in the ground, and indeed claim a kind of global right against their development, permanent sovereignty claims an opposing right to their development and against any such limits. Provisions that such resources be controlled by or benefit the people in whose territory they reside (Pogge 2001; Wenar 2008) allow for no global interests in those resources

remaining undeveloped, and indeed presume no such hard constraints on their development.

Key to international climate change mitigation objectives, then, is the imposition of two additional constraints upon the conditions under which a people may exploit their territorial resources: one limiting domestic fossil fuel development (or carbon production) and the other limiting domestic $CO_2$ emissions (or carbon consumption). Both challenge the permanent sovereignty principle if interpreted as wielding sovereignty against either constraint. Since the former constraint could potentially prevent poor countries from developing their fossil fuel resources in a manner consistent with the original objectives of the permanent sovereignty principle, it requires more than a friendly amendment if that principle is to serve the justice interests associated with its origin. As stated in international law and as thus far theorized within political theory and philosophy, permanent sovereignty makes no distinctions among and thus involves no priority between rich and poor states in deciding which claims to develop domestic fossil fuel reserves may be honored and which must be denied: all peoples are held to be sovereign over their territorial resources. The condition from Resolution 1803 that resource wealth be used for development purposes and to enhance the welfare of people within the territory only constrains the purposes to which rents from those resources might be used, not whether the resources can be developed at all. However, that resolution's references to following "the spirit and principles of the Charter of the United Nations" and advancing "the development of international cooperation" might now describe international climate change mitigation efforts, which require the imposition of limits on the production and consumption of such resources.

One might object that the resource ownership and development rights claimed under the permanent sovereignty principle are distinct from the limits on $CO_2$ emissions that are required of climate change mitigation efforts, in that carbon consumption constraints are indifferent to rights of carbon production. In principle, states or people could develop all of their fossil fuel reserves and bring these to market in the face of global limits on carbon consumption in the form of $CO_2$ emission caps. Fossil fuel production in excess of allowable consumption would simply go unsold, so strict carbon consumption budgets of the kind required by climate change mitigation efforts could be imposed without any sort of carbon production budget, through which permissions to develop fossil fuel resources were allocated among exporting states. So long as all parties adhere to their carbon consumption budgets, surplus production of carbon fuels would not affect climate change and thus also climate justice imperatives, allowing unlimited carbon production through territorial fossil fuel development.

Two considerations weigh against this hasty dismissal of concerns about the potential tension between resource sovereignty and climate change mitigation efforts. First, it falsely assumes that excess carbon production can be prevented from undermining adherence to carbon consumption budgets (Princen 2015) by ignoring causal relationships between production and consumption. Indeed, carbon pricing policies designed to reduce fossil fuel consumption while allowing unlimited fossil fuel extraction do undermine their intended effects upon behavior, as the increasing supply of such fuels reduces their market price at constant levels of demand,

negating any consumption decrease from pricing mechanisms. For example, a carbon tax would decrease consumption of carbon-based fuels at a constant market price, but the effects of the tax on carbon consumption would decrease and eventually cease as that market price declines with increased production. Similar to the rebound effect, through which rates of oil consumption can increase with improved automobile fuel efficiency, as the short run reduction in demand from efficiency leads to a drop in prices that in turn leads to drivers driving their cars longer distances, the imbalance between carbon production and carbon consumption would send contrary pricing signals to consumers, simultaneously prodding them to consume more and fewer fossil fuels (Hertwich 2005). In order to effectively reduce demand for fossil fuels, their market supply must also be correspondingly reduced, which requires limits on the production of fossil fuels as well as their consumption, or else rationing rather than pricing mechanisms for reducing consumption.

Second, relying upon markets alone to determine which exporters of fossil fuels can sell how much of their resources may undermine conservation objectives as well as those associated with the original purposes of the permanent sovereignty principle. Markets organized around a "first come, first served" principle, allowing production only up to the level of consumption budgets within a given compliance period, would encourage producers to more quickly exploit their resources within that period, perhaps at the expense of various environmental and safety protocols, in the rush to maximize market share. Those organized around a market price, as through a tradable extraction permit system or global carbon pricing system, would allocate production rights in inverse relation to production costs, allowing those able to extract their fossil fuel resources most cheaply the largest shares of export markets, exerting downward pressure on environmental and safety regulations that might drive up production costs as well as upon those severance taxes that might otherwise generate revenues for sustainable development. Only those producers able to sell their resources would be able to benefit from them, which is why the permanent sovereignty principle originally sought to guarantee market access for these resources.

From a global justice perspective, the allocation of fossil fuel production rights should be informed by justice principles, seeking to ensure that the world's resources are used in a manner that benefits the least advantaged. According to Resolution 1803, revenues from fossil fuel extraction should promote development in and enhance the welfare of those from whose territory such resources are extracted, but unless carbon production rights follow carbon consumption budgets in being equitably allocated rather than driven by market forces those revenues from fossil fuel extraction may accrue to rich rather than poor countries. Pogge's (2008) proposed global resources dividend would tax fossil fuels at the point of extraction and devote the revenues raised toward global poverty relief, but in doing so would likewise conflict with the ownership claims that permanent sovereignty connotes, since it requires that such revenues be used for the benefit of people in the extracting country alone, not placed in a global pool and redistributed. Territorial ownership of natural resources of the kind claimed by permanent sovereignty appears incompatible with proceeds from extraction of those resources being redistributed to the global poor, as well as to the prioritization of poor states in assigning carbon

production rights. Full territorial resource rights therefore appear to be incompatible with global justice commitments to granting the world's poor a partial stake in global resources as well climate justice commitments to carbon consumption budgeting. Either the permanent sovereignty principle as characterized above or these normative commitments must be modified in order to accommodate the other.

## Unequal Sink Capacity and Inequitable Emissions Rights

Before considering a proposal for modifying the permanent sovereignty principle in light of the above carbon production budgeting considerations, another constraint upon realization of climate justice imperatives implied by what might be termed *strong resource sovereignty* must be considered. Under the strong conception of resource sovereignty, states or peoples are entitled to full property rights in their territorial resources, including stock resources like coal or oil as well as flow resources like sink capacity. These rights include exclusive rights to use resources like carbon sinks, entailing emissions entitlements up to the capacity of domestic sinks, and claims to compensation for any unused sink capacity that is used by others. They also include the unlimited right to exploit territorial mineral resources, subject only to the constraint that these benefit the people of the state from which they are extracted. By contrast, weaker versions of the principle would ascribe only limited territorial rights, for example by assigning resource stocks (e.g. forests) to states or peoples but make flows (e.g. sink capacity) available for equitable allocation, or could limit resource development rights through instruments like carbon production budgets while otherwise recognizing other aspects of territorial resource right claims.

Under strong resource sovereignty, with full ownership claims or use rights to the world's carbon sinks assigned on a territorial basis, all countries would be granted entitlement to the sink capacities within their borders. The resulting international allocation of overall and per capita emissions rights would as a result of widely disparate national carbon sink capacities be highly inequitable, and thus in conflict with climate justice imperatives that seek more equitable resource-sharing arrangements (Caney 2012), including those specifically related to carbon sink capacity as well as those related to bundles of natural resources and ecological services like ecological space, which is likewise subject to similarly inequitable territorial distribution and thus requires a similar conception of resource sovereignty to equitably allocate (Vanderheiden 2009). According to an estimate of sink capacity from forest biomass (Myneni et al. 2001), Japan is estimated to have approximately 11 million tons of annual sink capacity from its territorial forests, while China has 39 million tons of sink capacity, Russia 284 million tons, the United States 142 million tons, and Canada 73 million tons. Granting use rights to territorial sinks to the people residing in each territory and controlling for population, Japan would be entitled to 0.03 tons of carbon emissions per capita from their territorial sinks, with the average resident of China entitled to 0.09 tons, the average American 0.44 tons, the average Russian 1.99 tons, and the average Canadian 2.06 tons, from the resource ownership claims implied by the strong version of permanent sovereignty.

One might mitigate this widely disparate per capita carbon sink access by more equitably allocating the sink capacity that lies within the global commons, but considerable disparity would remain after doing so. After allocating the 40 percent of terrestrial sink capacity from the world's oceans on an equal per capita basis, on grounds that these reside within the global commons and thus beyond territorial ownership, the per capita emissions entitlements would be 0.36 tons in Japan, 0.42 tons in China, 0.77 tons in the United States, 2.32 tons in Russia, and 2.39 tons in Canada. By virtue of their good fortune in being born into countries with large forests and thus vast sink capacities for their resident populations, Canadians and Russians would be entitled to per capita carbon footprints more than double the world average, after equitable allocation of oceanic sinks and full entitlement to territorial sinks, while those born into densely populated countries like Japan and China would be entitled to less than half of that average. Development opportunities and life prospects would largely become a function of a country's territorial sink capacity, under this conception of resource sovereignty, in some cases imposing severe and probably unmanageable constraints on such basic activities as food production and energy access upon those residing in sink-poor territories.

On the basis of both of these considerations, the strong version of permanent sovereignty appears to be incompatible with the need for sharp reductions in global fossil fuel consumption as well as equity imperatives in climate change mitigation, and would likely also be politically infeasible as a result. Climate justice analyses typically assume terrestrial sink capacity to reside within the global commons for purposes of its equitable allocation, despite the fact that most sinks reside within national territories (Blomfield 2013), in order to avoid national entitlement claims that undermine their equitable allocation. Imperatives for the equitable assignment of carbon emissions rights or mitigation burdens would thus require either a weak version of the permanent sovereignty principle that allowed for the reallocation of use rights to sink capacity against national entitlement claims, or else elimination of the principle altogether. Likewise with considerations of the need for an equitable carbon production budget, which the strong version of the principle would disallow in that it would impose upon states and people a constraint on territorial fossil fuel development additional to those found within Resolution 1803. A weaker version would allow states or peoples to control their territorial fossil fuel resources within the constraints set by carbon production budgets, granting them limited resource sovereignty, but would prohibit further carbon production than is compatible with international mitigation targets. A state's or people's sovereignty over their territorial resources would be bounded by global sustainability considerations under such a reformulation, much as rights of usufruct allow for the exercise of most ownership rights but prohibit willful destruction of the object.

Given these tensions between global justice and sustainability imperatives and strong resource sovereignty, one might be tempted to abandon the territorial resource rights claimed by the permanent sovereignty principle altogether, as unjustified legal protections of an unjust natural allocation of nature resource wealth, assigning all such resources to the global commons. Such a resource egalitarian view is common among theories of global justice, with Beitz claiming that "each person has an equal *prima facie* claim to a share of the total available

resources" on the planet (1975, p. 371), Pogge claiming that "the global poor own an inalienable stake in all limited natural resources," which entitles them "to a share of the economic benefits from the use of the resource in question" (Pogge 2008, p. 209), and Steiner that "each person's original right to an equal portion of initially unowned things amounts to a right to an equal share of their total *value*" (1994, pp. 271–272). Rather than developing a complicated account of resource rights in which stock resources in a forest are owned by one party but flow capacities by another, and where equitable resource entitlements matter for some resources but not for others, a tempting resolution to these two issues may be to eliminate all bases for *ex ante* unequal resource access.

However, assigning all resources to the global commons in order to more equitably assign carbon emissions rights would be too hasty. As a common-pool resource, functioning as a non-excludable but rival good that is depleted with use, carbon sinks are subject to commons tragedies unless access to them is restricted (Hardin 1968). The allocation of carbon emission rights offers the main vehicle through which access to sinks can be restricted, since an emissions right is no more than a permission to utilize some finite quantity of sink services. Climate justice imperatives offer reasons for assigning use rights to carbon sinks on a more equitable per capita basis, but other considerations weigh in favor of inequitable assignments of a kind that would not be compatible with sinks being relegated to the global commons. Chief among these reasons for maintaining some set of rights to carbon sink capacity are the incentives that can provide for the maintenance and enhancement of sink capacity and discourage their degradation, along with the original purposes of the permanent sovereignty principle, in providing revenues for development.

## Conclusions: Rethinking Resource Sovereignty

Imperatives to mitigate climate change require the global community to initiate sharp reductions in fossil fuel production and consumption, and so appear to conflict with strong resource sovereignty and its claim against externally-imposed limits upon natural resource development and use, insofar as national mitigate targets prevent states from fully exploiting their available sink capacities. Climate justice imperatives require that carbon sink access be assigned more equitably than is compatible with strong resource sovereignty, as previously observed. Taken together, these two considerations weigh in favor of assigning use rights (which combine enjoyment and exclusion rights) to carbon sinks more equitably than is possible under the strong conception, and within limits disallowed by it, allocating those flows on a limited and declining basis that corresponds with carbon abatement schedules designed to meet global temperature targets. Both objectives could potentially be served by voiding any territorial claims to carbon sinks, and treating carbon sinks as beyond territorial resource entitlement claims altogether, but several considerations weigh in favor of a weaker conception of territorial rights by which states have valid entitlement claims to some but not all of the capacities of their territorial sinks, and some but not aspects of the forests that serve as carbon sinks.

While imperatives of ambitious and equitable international climate change mitigation efforts weigh against strong territorial rights, interests in maintaining and even enhancing global sink capacity suggest a hybrid approach, through which some resource rights would be subject to egalitarian redistribution but others could be assigned to territories. Territories that allow their sinks to degrade or otherwise decline in capacity should be penalized for doing so, or given an incentive to prevent such degradation, but a pure commons approach makes no such sanction available. Conversely, incentives to enhance sinks are unavailable so long as these are assigned to the global commons, owned equally by all. Pragmatic concerns for providing such incentives, consistent with the theoretical bases for territorial resources rights surveyed above, would recommend a hybrid system in which territories acquire additional use rights to sinks (whether in terms of additional $CO_2$ emissions rights or subtractions from gross national $CO_2$ emissions to be reconciled with those rights) upon their enhancement, along with rights of disposition compatible with the development of carbon offset markets through programs like REDD, while forfeiting some of their use rights upon territorial carbon sink degradation.

This modification to (or interpretation of) the permanent sovereignty principle leaves intact the right to control territorial stock resource development, subject to Resolution 1803′s original welfare and development conditions as well as those necessary for preventing global environmental problems like climate change. Given that decarbonization imperatives will result in declining revenues from fossil fuel development in the future, considerations of justice in the assignment of carbon production budgets may be warranted, and these comprise a side constraint for the principle. Rights of disposition for the equitable per capita emissions rights that follow from equitable sink access should allow peoples in most developing countries to sell the unused sink capacity or emissions rights to which they are entitled under this equitable allocation, where no such revenue stream from global North to South would be available without international carbon trading and offset markets. These revenues should offset losses of revenue from keeping much of the remaining fossil fuel reserves in the ground, and provide for more sustainable forms of development than could be built upon fossil fuel extraction alone.

This revised or reconceived permanent sovereignty principle thus calls for limits on fossil fuel extraction that are circumscribed by ecological limits and the global effort to mitigation climate change, combined with the commitment to ensure that the benefits of global fossil fuel development are justly distributed, perhaps through the application of justice principles to the assignment of carbon production budgets. Since the revised principle treats latent or unenhanced sinks as part of the global commons, sink-rich countries like Russia and Canada stand to lose some of what was in the absence of functioning global carbon markets little more than a potential or hypothetical benefit, as their entitlements shrink under an equitable per capita assignment of sink capacity. By contrast, sink-poor countries benefit from this arrangement, which eliminates an arbitrary source of potential future inequality among peoples by declining to assign rights to full territorial sink capacities. It leaves intact the resource rights associated with forest stocks, which are unaffected by this revision, while creating incentives to better manage these forests, not only

for their carbon sink capacity but also for other ecological purposes. Perhaps of most importance, it updates and refines the permanent sovereignty principle to reflect the variety of resources upon which ownership claims can be made, and in light of the theoretical bases for and pragmatic consequences of those claims.

## References


Armstrong, C. (2014a). Against 'permanent sovereignty' over natural resources. *Politics, Philosophy and Economics, 14*(2), 129–151.

Armstrong, C. (2014b). Justice and attachment to natural resources. *Journal of Political Philosophy, 22*(1), 48–65.

Beitz, C. R. (1975). Justice and international relations. *Philosophy and Public Affairs, 4*(4), 360–389.

Blomfield, M. (2013). Global common resources and the just distribution of emission shares. *Journal of Political Philosophy, 21*(3), 283–304.

Bumpus, A. G., & Liverman, D. M. (2008). Accumulation by decarbonization and the governance of carbon offsets. *Economic Geography, 84*(2), 127–155.

Caney, S. (2012). Just emissions. *Philosophy and Public Affairs, 40*(4), 255–300.

Climate Council of Australia (2015). *Unburnable carbon: Why we need to leave fossil fuels in the ground.* http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf. Accessed 25 February 2016.

Hardin, G. (1968). The tragedy of the commons. *Science, 162*(3859), 1243–1248.

Hertwich, E. G. (2005). Consumption and the rebound effect: An industrial ecology perspective. *Journal of Industrial Ecology, 9*(1–2), 85–98.

Kolers, A. (2009). *Land, conflict, and justice*. New York: Cambridge University Press.

Kolers, A. (2012). Justice, territory, and natural resources. *Political Studies, 60*(2), 269–286.

Miller, D. (2012). Territorial rights: Concept and justification. *Political Studies, 60*(2), 252–268.

Myneni, R. B., Dong, J., Tucker, C. J., Kaufmann, R. K., Kauppi, P. E., Liski, J., et al. (2001). A large carbon sink in the woody biomass of Northern forests. *Proceedings of the National Academy of Sciences of the United States of America (PNAS), 98*(26), 14784–14789.

Pogge, T. (2001). The influence of the global order on the prospects for genuine democracy in developing countries. *Ratio Juris, 14*(3), 326–343.

Pogge, T. (2008). *World poverty and human rights* (2nd ed.). Cambridge: Polity Press.

Princen, T. (2015). The ethical: A fossil fuel ethic. In T. Princen, J. P. Manno, & P. L. Martin (Eds.), *Ending the fossil fuel era* (pp. 97–106). Cambridge, MA: The MIT Press.

Schrijver, N. (1997). *Sovereignty over natural resources: Balancing rights and duties*. New York: Cambridge University Press.

Steiner, H. (1994). *An essay on rights*. Cambridge, MA: Blackwell.

Vanderheiden, S. (2008). *Atmospheric justice: A political theory of climate change*. New York: Oxford University Press.

Vanderheiden, S. (2009). Allocating ecological space. *Journal of Social Philosophy, 40*(2), 257–275.

Wenar, L. (2008). Property rights and the resource curse. *Philosophy and Public Affairs, 36*(1), 2–32.

Wolf, C. (1995). Contemporary property rights, Lockean provisos, and the interests of future generations. *Ethics, 105*(4), 791–818.