Environmental Space as a Basis for Legitimating Global Governance of Environmental Limits

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Introduction

In recent years, there has been a resurgence of the discourse on environmental limits. In the early 1970s, international debate about environmental limits was triggered by the publication of the *Limits to Growth* report,[1] and boosted by the first "oil crisis" in 1973. The debate, often referred to as a discussion between Malthusian pessimists and Cornucopian optimists, continued through much of the 1970s and 1980s.[2] In the late 1980s, the debate receded, in part, because the predicted resource scarcity did not eventuate, or rather, was not reflected in the prices of commodities. It was also because the debate about limits was largely overtaken by the discourse of sustainable development, promulgated most effectively by the report of the Brundtland Commission.[3] Inasmuch as the sustainable development discourse refers to environmental limits, these are generally treated in very broad and vague terms, and as being surmountable by technological and managerial means, to the extent that economic growth and environmental protection are seen as compatible.

As concern about global warming is reaching unprecedented heights, there is growing recognition of the need to define globally limits to greenhouse gas emissions. Also, continuing growth in demand for natural resources (including oil and other minerals), notably associated with rapid economic growth in countries like China and India, has reignited concerns about the continued availability of, and access to, resources.[4] In a number of cases, such as with regard to freshwater, concerns in many parts of the world are aggravated by the combination of these two factors, ecological changes and the rising demand for natural resources.[5]

1. Meadows et al. 1972.
2. Barney 1981; and Simon and Kahn 1984.
3. World Commission on Environment and Development 1987, 187.
4. David Cohen, "Earth Audit," *New Scientist,* 26 May 2007, 36–43; Kerr 2007; and John Vidal "The Beginning of the End," *Guardian Weekly,* April 29–May 5, 2005, 15–16.
5. World Water Assessment Programme 2003.

Global Environmental Politics 9:4, November 2009

Against this background, the notion of environmental space has much to offer with regard to the framing of the renewed debate about environmental and resource limits. The "return of scarcity" can be interpreted in different ways, and used for different ends. There is a real possibility that the discourse on environmental limits will lead to an even harsher, more brutal, more unequal, and more undemocratic world. The notion of environmental space offers a basis for a more positive discourse on, and approach to, environmental limits. The aim of this article is to discuss this potential and explore how the concept of environmental space may help to enhance the legitimacy of the global governance of environmental limits. It does so in three main ways: first, by establishing a framework of principles and rules that recognizes environmental limits *and* offers a methodology for dealing comprehensively with these; second, by adopting a strong equity principle; and third, by providing a basis for the design of political-economic arrangements that have the capacity to enhance democracy, from the local to the global level of governance.

First, I will explain briefly the idea of environmental space and its main principles, and point out the need for its adoption at the global level. The next three sections then discuss each of the three grounds mentioned above. The focus will be mostly on normative arguments, although I will also touch briefly upon some of the issues, challenges, and risks associated with the implementation of these ideas.

Environmental Space

The notion of environmental space (ES) was first introduced by Horst Siebert in 1982. It has been defined as the "total space provided by the earth for our use without diminishing the possibilities for the future,"[6] and has been advanced specifically with the aim to "make sustainability concrete."[7] Environmental space analysts set out to determine the total "allowable" resource consumption on a geographical basis (depending on the resource in question), and to provide guidance to governments about the extent to which resource consumption within their territories should be reduced or can be expanded. It is based on two core principles: respect for ecological limits, and equal access to resources. To these, several other principles have been added, depending on the advocate or author.[8]

The first core principle, the need to respect ecological limits, is based on the idea that there are limits to the capacity of the Earth to absorb the pollution and waste associated with resource exploitation and consumption ("throughput" of material). Although it is not possible to determine these limits with absolute precision, and they often become apparent only when they have been

6. Davidson 1995 (translation by the author).
7. Buitenkamp, Venner, and Wams 1992, 17–18; and Opschoor and Weterings 1994.
8. Carley and Spapens 1998, 8–9; and Moffatt 1996, 50–52.

transgressed, enough is known to be able to set indicative (and adaptable) targets. Environmental space advocates also concur with the precautionary principle: uncertainty is no excuse for not accepting and setting limits. It should be noted that this argument about limits does not so much refer to the idea that the world is running out of resources, which Carley and Spapens characterize as a "red herring."[9] In most cases, limits are imposed by the "new scarcity" (ecological limits, which constrain the Earth's capacity to absorb pollution or "outputs"), not by available reserves ("inputs"), although Hille and others note that, for a range of non-renewable materials, depletion may indeed pose a problem, providing a case for restrictions on consumption on the basis of absolute scarcity.[10]

The second principle associated with the notion of environmental space is the equity principle. Many proponents of the concept take the view that the amount of environmental space available, at least with regard to "common pool" resources, should be distributed on an equal *per capita* basis.[11] Equity is considered "both a moral and a political necessity."[12] If there are limits to resource consumption, these should apply equally to all people. Gross inequalities in resource consumption are likely to provoke or contribute to political conflict. However, environmental space advocates do not necessarily agree on the implementation of this principle, an issue which will be elaborated upon below.

Apart from these two core principles, several other principles are also often linked to an environmental space approach. Among these are the "quality of life" principle, the precautionary principle, the proximity principle, the subsidiarity principle, and the principle that non-renewable resources should be exploited in a closed cycle. Most of these are related to the implementation of the two core principles. Carley and Spapens, however, refer to the quality of life principle as a third main principle associated with environmental space, implying that resource use must contribute to the quality of life. The need to limit or reduce resource consumption makes it important (even more than in the past) to ensure that resources are used to enhance or maintain quality of life, rather than for causes that do not do so. Limiting resource consumption does not necessarily imply a reduction of human well-being or happiness, as was pointed out long ago by John Stuart Mill.[13] More recently, evidence has been provided that beyond a certain level, increased resource consumption does not contribute to a higher level of human well-being, happiness, or quality of life.[14] Nonetheless, most people are trapped on the consumption treadmill, which is driven by

9. Carley and Spapens 1998, 85.
10. David Cohen, "Earth Audit," *New Scientist*, 26 May 2007, 36–43; and Hille 1997, 15.
11. Buitenkamp, Venner, and Wams 1992, 18; Carley and Spapens 1998, 66–74; and Sachs, Loske, and Linz 1998, 14–16.
12. Carley and Spapens 1998, 69.
13. Mill 1848, IV, 6.9.
14. Hamilton 2003.

the capitalist imperative of continuous economic growth, and which states have adopted as a core imperative. Reducing resource consumption, therefore, requires changing value systems and political-economic institutions above the level of individuals. Environmental space advocates emphasize that the definition of quality of life should be left to communities within their own cultures.[15]

Given these imperatives and the rather radical implications of the adoption of these principles, it is not surprising that governments have shown little enthusiasm for the concept. Although some governments, notably in the Netherlands, Denmark, and Norway, have expressed an interest in and commitment to adopting it, and/or acknowledge the need to reduce global resource consumption to the level of a "one planet economy,"[16] in practice, its implementation has been very limited. The most comprehensive application of the environmental space approach has been undertaken outside the sphere of government. In the 1990s, Friends of the Earth, in the context of its Sustainable Europe Campaign, produced a series of country reports that calculated the environmental space used by each country and compared this with the space to which they are entitled on a population basis.[17] No government has formally accepted such a report, however, or adopted and implemented environmental space as an overarching framework for its environmental policies.

Apart from the challenging nature of the environmental space principles, the considerable issues associated with their interpretation and application, and the predictable opposition to their adoption, there is also the broader "collective action" impediment. Even if within a country there was much sympathy and support for adopting the environmental space approach, it would make little sense to do so if other countries did not do so as well. Reductions in resource consumption achieved by some countries can easily and quickly be negated by other countries that continue to expand their use of resources. Therefore, it seems unlikely that the environmental space approach will make much headway unless it is adopted at the international or even global level.

However, the adoption of the environmental space approach at these levels seems equally, if not more, problematic and unlikely, given the formidable political-economic obstacles associated with the imperatives of capitalism, the competitive state system, deeply entrenched socio-cultural patterns and differences, and the relatively weak basis of support and agency for the approach.[18] Given the obstacles to systemic change, and with the continuing build-up of multiple pressures in an increasingly interconnected world, a breakdown of current systems seems inevitable.[19] Building and strengthening international support for ideas, values, and norms that can provide the basis for a new interna-

15. Carley and Spapens 1998, 72–74 and 134–167.
16. United Kingdom 2005, 44.
17. Friends of the Earth International 2008.
18. Bührs 2007.
19. Homer-Dixon 2006.

tional order is crucial if systemic change in a positive direction, or recovery, is to occur. In that context, the concept of environmental space can play an important role as it provides a normative and practical framework that contributes to enhancing the legitimacy of global governance in dealing with environmental and resource limits.

Environmental Space as a Framework for Identifying and Addressing Limits

As explained in the previous section, the environmental space approach interprets, in first instance, environmental limits from an ecological perspective. In most cases, resource use must be limited because of ecological constraints, not for reasons of absolute scarcity. Even though many resources (such as coal) will continue to be available and relatively plentiful, their exploitation and use must be limited for ecological reasons. Ecological limits create a "new scarcity."[20] Although transgressing ecological limits may seem unproblematic to some extent and/or for some time, at some point this will lead to the collapse of ecosystems and disruption of the resource base and ecological services on which humans (and other species) depend.

This insight is, of course, neither new nor exclusive to the environmental space approach. The importance of nature as the source and basis of all life is a common element in the belief systems of most traditional cultures. This is not to say that traditional societies always lived in harmony with nature: they often did not, paying for this with an erosion of their subsistence basis or even their existence.[21] Ignorance was an important factor in many cases, in the sense that people had no way of knowing the extent to which their resource base, which often seemed abundant or unlimited, was vulnerable to collapse. If people survived, it was because they learned from their mistakes, were able to import essential resources from elsewhere, or moved to a new place.

With economic globalization and the growing dependence of countries on external resources,[22] maintaining the ecological and resource basis for human life has become a global challenge. This, arguably, is the most important point made by the *Limits to Growth* report and its sequels, even if there is scope for debate about whether and when particular resources will be depleted. The growing demand for resources, no matter where it originates, inevitably has repercussions for their global availability and price. Although control over most resources rests with governments and businesses, questions about their long-term availability and quality, as well as distribution and allocation, are ultimately of global concern. To resolve these issues effectively, they must be addressed at the global level, however difficult this may be.

20. Simpson, Toman, and Ayres 2005.
21. Carter and Dale 1955; and Diamond 2005.
22. Simms, Moran and Chowla 2006; and Simpson, Toman, and Ayres 2005.

The environmental space approach, which takes a comprehensive and global look at resource availability and absorptive capacity, can be used to identify limits and to specify objectives and targets across a wide range of resources and issues. Based on the two main principles mentioned previously (the existence of limited "space" and the strong equity principle), the total amount of available environmental space can be calculated for any group or geographical unit with regard to each resource, activity, or type of emission. For reasons of practice and principle, calculations are based on resource consumption. Rather than setting limits for individual pollutants and waste streams, which are very large in number and varied, the combined environmental effects (the "ecological backpack" or "rucksack") associated with the exploitation and consumption of specific resources or categories of resources are assessed. Assessments have been made for energy, non-renewable resources, freshwater, wood, and land use, covering about 90 percent of all material flows. As resources are exploited primarily for the benefit of consumption, end-users carry foremost responsibility for the "full damaging effect of the ecological backpack," and thus for reductions if required—not the residents of the exporting countries.[23]

Based on the level of "throughput" that is considered ecologically sustainable, the total amount of resource consumption that may be allowed (within the most appropriate geographical/ecological unit: global, continental, or regional) is determined. This amount is then divided by the number of people living in the relevant geographical unit to determine a *per capita* entitlement to the resource. As nation-states are usually seen to be the most relevant unit to take political responsibility for the level of resource consumption, the total allowable level of resource consumption for nations, based on population size, is calculated. These national entitlements can then be compared to existing levels of consumption. The difference between these figures indicates the amount of over- or under-consumption. In the case of over-consumption, this can be labelled the "sustainability gap." For resources considered too environmentally damaging or risky, such as chlorine and nuclear power, environmental space is set at zero, implying a phase-out. According to these calculations, most high-income countries use most resources at a rate far above the environmental space to which they are entitled.[24]

Such an approach, if implemented, would avoid a shifting of environmental pressures that could result from imposing limits in some areas or respects, geographically or with regard to a particular resource. Consider the case of biofuels, one of the more recent examples of the tendency to shift environmental problems. As limits would be determined for all resources and at all levels (including local ecosystems), it would avoid increasing pressure on forests,

23. It should be noted that environmental space analysts do use CO_2 emissions as a basis for determining the amount of environmental space associated with energy resources (rather than the resources themselves), because of the "critical nature" of global warming and because it is "currently the best environmental indicator for fossil-fuel consumption." Carley and Spapens 1998, 61.
24. Carley and Spapens 1998, 30–47, 75–106.

biodiversity, arable land, and water for the sake of growing crops for the production of biofuels, a consequence of the narrow focus on limits associated with energy resources.

Of course, determining a global framework for the overall amount of environmental space is a daunting task, let alone assigning "entitlements" to countries, as has already become apparent in the climate change issue. It assumes that agreement can be reached at the global, regional, and national levels on the nature and level of the resource limits that are required, and that governments are willing and able to accept limits or quotas. There is, of course, considerable uncertainty and scope for disagreement on the need for determining limits. Also, the approach has shortcomings and limitations that must be addressed. For one, the methodological issues associated with the interpretation, operationalization, and analysis of environmental space should not be underestimated.[25] Linking and aggregating environmental effects with resource exploitation and consumption is not just information-hungry, but also requires making all kinds of assumptions in the face of uncertainty. Significant questions arise also about the scale to which the concept has been applied, which has not been consistent throughout environmental space analyses. Also, using *per capita* consumption as an indicator for equity hides potentially large differences in resource consumption within countries. Furthermore, environmental space analyses are sometimes unclear or confused with regard to the allocation of responsibilities. On the one hand, responsibility is assigned to "end-users" who benefit from resource consumption, implying a need to reduce consumption and change values; on the other, companies are the agents most directly responsible for the environmental impacts of exploitation, production and transport of resources (albeit influenced by competition, governments, and international regulation).

Perhaps one of the most important points to emphasize is that the assessment and determination of environmental space are not solely or even primarily matters for science and scientists. Although some environmental space analysts advocate a strict separation of the scientific determination of environmental space from politics,[26] most take the view that determining limits is a values-based activity. Assessing limits inevitably involves making judgements, for instance, on the nature of the limits, including which aspects of ecosystems or resources to include, and on the essential level of "space" that must be maintained. This is not an argument against using the notion of environmental space, or against determining quantitative limits. The main point to be made here is that, for the idea of "concrete" environmental and resource limits (environmental space) to be adopted at the global level, a raft of scientific, methodological and political issues must be addressed and resolved.

The notion of environmental space is similar to, and to some extent over-

25. De Jonge, Van Assche, and Mazijn 2001; Hanley et al. 1999; Moffatt 1996; and Musters et al. 1994.
26. De Jonge, Van Assche, and Mazijn 2001, 55.

laps with, other concepts that aim to operationalize limits within which human impact should stay in order to maintain ecological sustainability, notably carrying capacity and ecological footprint. Traditionally, carrying capacity was defined in terms of the size of a population that could be sustained within a particular ecosystem or region. Thus, applied to humans, the concept implies that people should live mostly or even exclusively from the resources available in the region in which they live. This raises some tricky questions—for example, regarding trade, differences in resource endowment between regions, and movements of people within or between regions—and can give rise to quite unpalatable arguments, such as opposition to providing food aid to starving people in a region said to be exceeding its "capacity." Also, in an increasingly interdependent world, a totally "bio-regionalist" position seems increasingly unrealistic and untenable, as few people or societies would still aspire, or even be able, to live solely from a regional resource base. More recently, proponents of the carrying capacity concept use it in a global context, applying it to humanity as a whole, which is more realistic and provides a better link with the environmental space approach.[27] Assessing the ecological limits to resource use is, in large part, a local or regional task that feeds into a global assessment of resource capacity, but does not (and should not) necessarily determine how many people live in a particular place.

The notion of "ecological footprint" has enjoyed growing popularity ever since it was put forward by Wackernagel and Rees.[28] In some ways, the notions of environmental space and ecological footprint are quite similar. Both take a global perspective to sustainability and aim to quantify it. Both provide a means of calculating the environmental impact of any particular group, and the significant differences between consuming units. Users of both concepts raise questions regarding (in)equity and (re)distribution. In other respects, however, the concepts are significantly different. First, they rely on different methodologies. The concept of ecological footprint, by aggregating resource use with the help of a single denominator (productive land), is particularly helpful for educational purposes directed at calculating and comparing a population's overall environmental demands. To determine whether a country's level of resource use meets, exceeds, or falls short of the sustainability criterion, its total ecological footprint is compared with the total amount of (productive) land within its borders. By contrast, the notion of environmental space uses a range of indicators for different resources, and is not typically expressed in a single or composite indicator because doing so is considered methodologically problematic and inappropriate.[29]

The methodological differences between the two concepts are important in several respects. First, the different assessments of performance on the

27. Arrow et al. 1996.
28. Wackernagel and Rees 1996.
29. Hille 1997.

sustainability criterion may have implications for whether countries are seen as "living within their means." In the environmental space approach, all countries with a level of *per capita* resource consumption which is higher than can be considered (globally or regionally) sustainable live "beyond their means" and must reduce their consumption of that resource. By contrast, according to the ecological footprint approach, a country with "surplus (bio-)capacity" may be considered to live within its means, which suggests that it would be acceptable for such a country to expand its production (regardless of its *per capita* ecological footprint). *Ceteris paribus,* this will lead to higher incomes for its residents and therefore to an increase in their resource consumption, even if this is already at an unsustainable level. Second, ecological footprint analyses appear less fruitful in terms of providing specific policy guidance. Environmental space indicators can be used as a basis for formulating specific objectives and targets, which are commonly seen as the rationale for such analyses. Ecological footprint indicators, in contrast, do not and cannot provide specific clues about what can or should be done to advance sustainability; footprints are a composite measure of a range of different forms of resource use and environmental impacts, each of which is likely to differ with regard to environmental capacity and require different policies to advance sustainability.

Ultimately, the protection of the Earth's carrying capacity is an ethical and moral issue of fundamental (existential) importance. A case could be made for enshrining the protection of environmental space in international law as a fundamental obligation on the part of all humankind, including governments and businesses. In negative terms, deliberately causing the erosion of environmental space could be defined as the ultimate crime against humanity (assuming nonhuman nature will continue, or even flourish, without humans). In the following sections, I discuss two further normative grounds that provide a basis for advancing the institutionalization of the environmental space approach at the global level.

The Equitable Distribution of Environmental Space

The environmental space approach, as indicated above, is based on the principle that available space should be shared equitably or even equally between all members of humankind. For instance, when it comes to the distribution of rights to emit greenhouse gases, environmental space advocates take the view that, in principle, all people on Earth should have the right to the same *per capita* level of emissions. Inasmuch as the existing *per capita* emissions of low income countries are lower than the global *per capita* average, people in those countries have the right to increase their emissions, and even more so if "historical emissions," for which the now-rich countries are mostly responsible, are taken into account.[30]

30. World Resources Institute 2001.

Although environmental space advocates generally agree that environmental space should or must be shared equitably, they seem to differ on whether this applies to *all* resources, and are not always clear on whether this necessarily implies *equality* and relates to *ownership* of resources. Some authors argue that equity or equality should apply only to "truly global" resources such as the atmosphere.[31] Others also regard energy and raw materials as global resources, but regard wood and agricultural products as continental resources and water as a regional resource, implying equitably sharing different resources at different levels.[32] Carley and Spapens take a more consistently global approach to all resources, although they admit that for some resources, such as water, environmental space is best calculated regionally.[33] Authors also differ in the extent to which they interpret equity as equality, with some interpreting it as implying equal shares[34] while others emphasize that equity does not imply redistribution and see egalitarianism "as the exception."[35] However, environmental space advocates all seem to agree that the core of the issue is resource *consumption* and ignore the issue of *ownership*. They seem to assume, implicitly, that more equitable consumption of resources can be achieved by other means than changes in ownership.

This indicates that the adoption of the equity principle, and even more so its implementation, is highly problematic. Philosophically and ideologically, dominant thinking does not provide much support for the idea that people in the world have equal "material" or positive rights, as is implied in the sharing of environmental space. Traditionally, concerns about inequality and justice have been discussed mainly in the context of defined political-geographical units. Some authors take the view that there is no case for international distributive justice, as people in the world are not collectively bound by contract.[36] Only citizens belonging to the same society or political system may determine, and may be bound to, principles of distributive justice.

That all people (should) have an equal right to the material conditions for their existence or well-being, or the fruits of the use of environmental and natural resources, is not an idea shared by many contemporary thinkers. Dominant (neo)liberal philosophy emphasizes the rights of individuals but seems to take for granted the existence of material inequalities, whether endowed by nature or created and sustained by human processes and institutions. If material inequality is problematized, it is largely because of (potentially) undesirable consequences or "side-effects," not because of a view that inequality is inherently objectionable. As Beitz notes, "It would be naïve to complain about global

31. Buitenkamp, Venner, and Wams 1992, 170; and Sachs and Santarius 2007.
32. Friends of the Earth Europe 1995, 11–13.
33. Carley and Spapens 1998, 75–106.
34. Carley and Spapens 1998.
35. Buitenkamp, Venner, and Wams 1992, 169–170; and Sachs and Santarius 2007, Chapter 4, especially 135–136.
36. Rawls 1999; and Tasioulas 2005.

inequalities on simple inegalitarian grounds."[37] Inasmuch as rich countries are concerned about equity issues associated with sustainable development, they tend to focus on *intergenerational* equity (future generations) rather than on *intragenerational* equity.[38]

Congruent with this is the shift in focus in international discourse from inequality to (extreme) poverty, furthering the idea that inequality *per se* is not really a problem. More generally, inequality is simply seen as a matter of fact, or even as a "positive, restraining, and ordering force."[39] Reducing poverty, from this point of view, depends foremost on the good will of the rich, and is not a moral or political obligation. It may involve writing off debt, improving aid, and providing better market access to exporters from low income countries (boosting economic development), but it is not generally thought of as being associated with equal rights or requiring fundamental political-economic change. From a neoliberal perspective, the best way to reduce poverty is economic growth. But economic growth, even if it lifts many of the poor above the threshold of extreme poverty, also *increases* both inequality and resource consumption, making it an ineffective and unsustainable way of achieving poverty reduction.[40]

However, the view that environmental space should be shared equitably or equally does have some support. Although the argument can be challenged on the basis of ethical reasoning, the objections are not necessarily fatal or fundamentally flawed.[41] It aligns well with the ideas of those often referred to as cosmopolitans, who proclaim principles for international distributive justice.[42] Long ago, Beitz expressed the view that "no one has a natural *prima facie* claim to the resources that happen to be under his feet."[43] "Laissez-faire redistributivists" such as Steiner also take the view that in a "fully appropriated world, 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*."[44] However, it is not uncommon for such views to be dismissed as unrealistic and idealistic. Dominant political-economic thinking is not based on equity principles, but on a blend of national and capitalist interests that promotes competition over, rather than a sharing of, environmental space.

However, much of the debate about poverty and whether the rich have moral obligations towards the poor ignores the political-historical sources and aspects of poverty and inequality. Philosophers addressing these issues tend to focus on general moral principles. Yet, taking the dominant views on poverty and inequality for granted, and not questioning or even noticing the political-

37. Beitz 2001, 97.
38. Redclift and Sage 1999.
39. Woods 1999, 10.
40. Woodward and Simms 2006.
41. Page 2006.
42. Beitz 1999a; and Pogge 2001.
43. Beitz 1979, 292.
44. Steiner 1994, 271, quoted in Beitz 1999b, 282.

economic and ideological basis for this dominance, is arguably more naïve than explicitly defending an egalitarian stance (unless, of course, this disregard is deliberate). In reality, control over and access to resources has never been determined solely or even mainly by principles, but by social and political forces and processes. To understand the situation in which countries, societies, peoples, and individuals find themselves with regard to consumption of and access to resources, we need to look at geography, history, and political-economic relations.

Whether "underdevelopment" is regarded as the result of unfavorable or "unfortunate" conditions in poor countries or attributed to exploitative relationships is likely to have implications for one's views on equity and justice. Although some liberal philosophers admit that (neo)colonialism may have something to do with the economic and social disparities in the world,[45] many tend to focus instead on the issue of intergenerational justice, often associated with the notion of sustainable development (the needs/rights of future generations).[46]

By contrast, those who attribute much or most of the existing inequalities in conditions and life chances to (neo)colonialism and exploitative relationships inherent to capitalism see the issue of equity not so much in terms of (possible) moral obligations on the part of the rich towards the poor, but as a right of those who have been exploited to redress for injustice and to seek structural political-economic change. As Wissenburg notes, to the extent that inequity can be attributed to (neo)colonialism, it is an issue of *retributive* rather than *distributive* justice.[47] However, as long as political-economic relationships continue to be a source of (growing) inequality, distributive justice requires more than financial compensation for past injustice, and arguably a right to a part of the surplus created from the use of (under-priced) resources and labor—all the more so when the result of these exploitative relations has been the erosion or even depletion of the resource base for the development of poor countries for the benefit of the (now) rich countries, creating an "ecological debt" of the latter towards the former.[48] As Hornborg notes, the exploitative nature of these relationships has been "made invisible by the vocabulary and ideology of the market. This unequal exchange of resources can be made visible only by identifying, beneath the flows of monetary exchange value, measures of real resources such as energy, labor time, and hectares of productive land."[49]

The environmental space approach provides a basis for making visible the extent to which the distribution of wealth and income, at the national and global level, is based on the consumption of natural resources, now and in the past. Historically, and up to the present day, the rich countries consume most of the world's resources, and are responsible for most of the (accumulated) pollu-

45. Wissenburg 2006.
46. Redclift and Sage 1999.
47. Wissenburg 2006.
48. Martíinez-Alier 2002.
49. Homborg 2003, 215.

tion associated with their exploitation, production, and transport.[50] If resources are becoming scarcer, and/or the space for using them within ecologically acceptable limits shrinks, there is a strong case for arguing that the remaining available space be evenly distributed on a *per capita* basis, or even that more be given to those who have not used or been able to use this space in the past. In this context, resource endowment or ownership is less relevant than who *consumes* and *benefits* from resources.[51] However, the means by which a more equal right to environmental space (including natural resources) can be translated into practical terms, institutions, policies, and mechanisms is a question that has hardly begun to be addressed, let alone implemented.

Ideas put forward on this matter include Beitz's principle on the distribution of natural resources,[52] Steiner's proposal for a universal land tax,[53] and Pogge's suggestion of a Global Resource Dividend.[54] As discussed by Hayward,[55] each of these schemes has limitations. Beitz's principle is based on endowment, making countries that are resource-rich (but economically poor) potentially liable rather than giving them rights. Whether and to what extent countries have consumed and benefited from natural resources is a more appropriate basis for assessing claims to environmental space than resource endowment and geographical distribution. Steiner's idea of a universal land tax, although it does take into account the extent to which a resource (in this case, land) of a country has gained in value, is too narrow as a proxy for all natural resources and the extent to which a country has benefited from them by adding (or receiving) value to/from them, and may promote the development rather than the conservation of resources.[56] Pogge's proposed levy on (selected) resources when they are harvested or extracted (rather than consumed) potentially hits poor countries more than the rich, and may also work counterproductively with regard to their conservation.[57] Hayward's suggestion, imposing a tax on the extent to which a country exceeds its use of ecological space, appears to serve better the dual aims of discouraging environmental overuse as well as enhancing distributional justice.

Hayward, however, uses ecological footprint as the basis for assessing a country's consumption of ecological space. This also raises an equity issue if ecological footprint calculations of ecological deficits (or surpluses) are based on endowment, as discussed previously. It seems unfair to expect people in smaller and more densely populated countries to accept a lower level of sustainable consumption than people in big and sparsely populated countries, even if

50. Carley and Spapens 1998, 41–44; Sachs and Santarius 2007; and World Resources Institute 1994, Chapter 1.
51. Hayward 2006.
52. Beitz 1979, 125–176.
53. Steiner 1999.
54. Pogge 2002.
55. Hayward 2006.
56. Hayward 2006, 367
57. Hayward 2006, 367–368.

people in the latter have a *larger* ecological footprint. A more appropriate assessment of the overuse of environmental space, at least in terms of resources, would be to base it on actual resource or material flows between countries, and on an assessment of the amount of embodied pollution that accompanies those flows.[58] However, such assessments are still in their early days and enormously complex and demanding, given the numerous products that are traded, the wide range of materials embedded in many manufactured goods (such as computers), the multiple sources of origin of raw materials, and the various process stages along the chain of production. Acquiring all the required information assumes the cooperation of processors and manufacturers, which can be problematic. The demanding nature and considerable costs and challenges associated with this approach make it a cumbersome basis for policy (taxation) purposes. As resource consumption is roughly correlated with the level of personal income and wealth,[59] it might be much easier, and fairer, to impose an environmental space overuse tax on individual income and wealth. Although individuals and countries differ in the *efficiency* with which they use particular resources (such as energy), it is the level of disposable income (*minus* savings) that determines the *total level* of resource consumption (including that related to travel, second houses, and luxury items). The main point to be made here is that further research and discussion are needed on options for translating the environmental space approach into the most effective, desirable, and feasible policy instruments.

Bringing about a more equitable use of resources, therefore, is not just a matter of putting forward ideas and proposals. Although ideas and proposals are important, they need a socio-political basis to be realized. Agency, and the relative power of agents, plays a crucial role in the advancement and implementation of ideas regarding environmental limits and equity. Whether the environmental space approach will be adopted and used for promoting equity depends largely on the extent to which its social basis of support can be widened and strengthened by, among other means, expanding democracy.

Environmental Space and Democracy

There is a possibility that the rich use the discourse on (shrinking) environmental space as a basis for protecting and maintaining their privileged position[60]—especially if it is linked with the notion of "environmental security," which has also been hijacked by those who seek to protect the "national interest."[61] There is a real risk that the growth (or return) of scarcity will lead to a concentration and strengthening of power and control over resources at the global level to the benefit of the already rich and powerful, notably via transnational corporations

58. Adriaanse et al. 1997; and Muradian, O'Connor, and Martínez-Alier 2001.
59. World Resources Institute 1994, 16.
60. Altvater 1998; and Redclift and Sage 1999, 133–140.
61. Deudney 1990.

(TNCs), and to *less* rather than *more* democracy.[62] As Redclift and Sage note, present tendencies towards global environmental management "strengthen the hand of transnational and multilateral institutions in the name of the common good" and provide a basis "for the powerful to exert control over the resources of others in the name of planetary health and sustainability."[63] It is imperative, therefore, that those who recognize environmental limits, advocate greater equity, and aim to promote democracy also search for ways by which democracy, and its social basis, can be strengthened.

Many analysts of environmental politics believe that *enhancing* democracy to deal more effectively with environmental problems is necessary, desirable, and feasible. Analysts point out that much of the progress in the recognition and tackling of environmental problems stems from, and requires, political institutions and innovations that allow and enhance public participation, openness, and accountability—in short, the introduction and enhancement of democratic systems.[64]

Governments, so it seems, have also embraced this view and moved away from the so-called "command-and-control" approach to environmental management towards the adoption of the notion of "environmental governance" and its associated "new" policy instruments, including voluntary approaches, "partnerships," and economic instruments.[65] Advocates may differ on what they see as the most desirable ways and forms of enhancing democracy (decentralized, deliberative, ecological, the "greening" of states), but at the early stage of the 21st century, the beliefs of democratic optimists appear to hold more sway then those of the pessimists.

Arguments in favor of enhancing democracy also extend to the global level. Given the absence of a world government, calls for the democratization of global governance have focused, in particular, on the United Nations, the World Bank, the International Monetary Fund, and the World Trade Organization, and on the development of "global public policy networks."[66] Cosmopolitans advocate the extension of the principles of liberal democracy to the global level.[67] In practice, however, at this level the dominant trend has been towards "governance" and the involvement of the private sector in the design and implementation of policies rather than towards the creation or strengthening of formal democratic institutions.

The trend towards "governance" is usually portrayed as positive and synonymous with democratization, as it involves the participation of "stakeholders." However, underneath this apparently positive development lurk some serious threats to the increasingly frail democratic institutions commonly re-

62. Hardin 1968; Heilbroner 1980; and Ophuls and Boyan 1992.
63. Redclift and Sage 1999, 134–135.
64. Baber and Bartlett 2005; Doherty and de Geus 1996; and Paehlke 1990.
65. Jordan, Wurzel, and Zito 2003; and Tews, Busch, and Jörgens 2003.
66. Benner, Reinecke, and Witte 2003; One World Trust 2006; and Reinecke and Deng 2000.
67. Beck 2006; and Held 2003.

ferred to as liberal democracy. Environmental governance, and the associated instruments upon which it relies, can enhance the scope for powerful and dominant interests to shape environmental decisions and policies, and be less democratic than the so-called "command-and-control" approach. More generally, the notion of "governance" can be seen as a cloak for the neoliberal agenda of promoting a retreat of the state. The growing popularity of the "new" instruments, forms of "self-regulation" (such as environmental management systems), and "partnerships" can best be seen as moves by businesses to forestall the threat of more stringent regulatory action by governments in the face of rising public concerns and demands.[68] These instruments give businesses the opportunity to remain in control and to introduce environmental measures on terms that are more acceptable to them, and may effectively amount to the privatization of environmental governance. At the international level, the use of "partnerships," for instance, in tackling problems associated with the lack of provision of basic services (clean water, sewage treatment), may function as a cover for the expansion of the interests of TNCs and the privatization of resources and facilities, serving only those who have the ability to pay.[69]

Although NGOs are often invited to participate in this "partnership" approach, this does not make the approach democratic. Agreements are often negotiated and concluded behind closed doors and not subject to input from, let alone formal approval by, the wider community. NGOs do not have the same resources or bargaining power as big businesses, and risk being captured by the latter in exchange for dubious promises and measures of doubtful or limited environmental effectiveness that do nothing to protect common-pool (or, for that matter, privately owned) resources.[70] Voluntary agreements and "partnerships" are no substitute for decisions made by democratically elected governments on behalf of an entire political community, and for which they can be held accountable.

The growing recognition of environmental and resource limits, then, has already provoked responses that tend to concentrate power and control over resources, remove decision-making further from democratic control, and aggravate rather than remedy concerns about equity and equality, and which are not necessarily environmentally effective. Although advocates of the environmental space approach address concerns about environmental limits and equality, they tend to ignore or underestimate the extent to which the environmental space/limits discourse can be used to further legitimize the concentration of power and control over, and ownership of, resources, including those that are often considered as public and collective goods.

To counter the potentially undemocratic developments associated with the reliance on "governance," there is, therefore, a strong case for extending for-

68. Andrews 1998; and Clapp 2005.
69. Finger 2005; and Franck Poupeau, "Commodifying Rain. Global Market in Water," *Le Monde Diplomatique* (English edition), May 2002, 13.
70. Andrews 1998; and Rowe 2005.

mal liberal democracy to the global level, as advocated by cosmopolitans. However, although extending liberal democracy to the global level is important, it should be noted that it is also a limited form of democracy, and increasingly under threat from the concentration of economic power and growing economic inequality within and between countries. Extending liberal democracy to the global level is, therefore, unlikely to be a sufficient condition to stem the undemocratic threat associated with growing ecological and resource scarcity. To achieve the latter, the principles of democracy must be extended to the realm of political economy. The key to strengthening democracy and its socio-economic basis lies in the advancement of economic rights.

That creating a more even economic playing field is an important condition for democracy has been long recognized,[71] although the point has been ignored by the advocates of neoliberalism who have become so dominant at the national and international level during the last twenty years. However, as economic inequality is resurfacing as a global issue of social justice, and in association with environmental and human rights,[72] momentum is building to revisit the issue of economic democracy. Here, too, businesses are trying to forestall (internationally) binding regulation, notably by adopting the notion of corporate social responsibility,[73] but fundamentally this does nothing to either reduce economic inequality or to introduce economic democracy.

How economic democracy can or should be promoted is, of course, also subject to debate. It is beyond the scope of this article to elaborate on the diversity of views and ideas on this matter. But what needs highlighting is that not all schemes to promote economic democracy *necessarily* include recognition of environmental limits. Traditionally, economic democracy has been driven more by economic and political than by environmental concerns. However, this does not imply that the latter do not or cannot play an important role in schemes that advance economic democracy; the limited evidence available suggests that they do.[74] On the other hand, whether and how a "steady-state" economy may contribute to or require economic democracy is a question that has drawn considerable discussion among (notably green and eco-socialist) environmental advocates,[75] be it more in a local and national than global context.

The value of connecting the notion of environmental space with the search for enhancing democracy lies in its focus on specific resources and the need to bring their management in line with ecological and social parameters. Thus, the notion of environmental space provides a framework for "re-embedding" resource (economic) decisions and management (and the biophysical or

71. Dahl 1985.
72. Jonathan Freedland, "The Problem of the Rich," *Guardian Weekly,* December 2–8 2005, 24; Hayward 2006; Held and Kaya, 2007; Hurrell and Woods 1999; Sachs and Santarius 2007; and World Bank 2003.
73. Rowe 2005.
74. Booth 1994.
75. Barry 1999; Barry and Smith 2005; Eckersley 1992; and Sarkar 1999.

material flows ignored by standard economics) within collectively defined ecological limits and social criteria, including equity. Managing environmental space equitably implies the application of democracy not only to overarching political institutions, but also to decisions regarding specific resources or categories of resources. It requires the design of institutions and processes, within appropriate ecological and socio-geographical contexts, that provide opportunities to those affected by decisions on specific resources or sub-areas of environmental space to have a say in those decisions.

Here, I can refer only to some examples of what this could mean in practice. One example is provided by a variation on the ideas of tradable permit schemes for emissions. Such ("cap-and-trade") schemes are often promoted as a more efficient and effective means of reducing emissions than taxes or other forms of regulation, and tend to be preferred by economists and the business sector as they offer flexibility with regard to the means by which reductions are achieved, and can be economically advantageous. For instance, to reduce greenhouse gas emissions at the global level, such an approach, under the name of "Contraction and Convergence," has been advocated as being superior to that taken under the Kyoto agreement.[76] However, although such a scheme has the potential to (cost-)effectively reduce emissions, and may generate considerable income for countries that presently emit, *per capita*, less than the global average, it guarantees neither that the benefits will accrue to the poor (even if poor countries may gain) nor that control over resources is democratized.

Given certain conditions and appropriate institutional frameworks, a variation on such proposals has the potential to meet the concerns about environmental limits *and* to enhance intragenerational equity and to promote democracy. The key to achieving this combination of goals lies in the way emission rights are distributed and managed. Rather than allocating emission rights to polluters, a strong case can be made that, if such rights are to be created, they should be distributed on an equal basis to all people. In addition, such rights should be made inalienable (to avoid their accumulation into a few hands) and managed by elected and accountable agencies, within an appropriate ecological and socio-geographical context, on behalf of and with input from those who live in that area. Moreover, such rights should be managed and used for the purpose of maintaining or enhancing the resource base (which does not exclude people benefiting as individuals) rather than for merely economic (private or collective) gain. For instance, the income from the collective CO_2 emission entitlements sold or leased from year to year by regional special-purpose agencies to emitters could be used to subsidize public transport or a raft of energy- and emissions-saving measures, including house insulation and the installation of solar hot water systems. How such income should be used would be a matter for the community to decide.[77]

Another example of enhancing public and democratic control over re-

76. Meyer 2000; and Fred Pearce, "Saving the World, Plan B," *New Scientist,* 13 December 2003, 6–7.
77. Bührs 1996.

source management can be found in the establishment of community-owned renewable energy projects, such as wind turbines that feed local energy needs and supply surplus energy to the national grid. Such schemes are already common in Denmark, a country which has taken an early lead in the development of wind energy. Rather than concentrating ownership, control, and benefits associated with the development of wind farms in major energy companies, as is the case in many other countries, this approach gives communities a (financial) stake and say in sustainable (energy) resource management and its expansion, and does not provoke the degree of opposition often associated with the former.[78]

This discussion shows that recognition of limited environmental space at the global level does not necessarily imply that strengthening governance at that level must come at the expense of national and local power and democracy. Although setting overall limits to the use of environmental space often will require agreement at the global level, national and local governance institutions remain essential to ensure resource use is brought, and remains, within those limits. Thus, although global framework conventions could be concluded for sub-areas of environmental space—for instance, to protect freshwater, productive land, biodiversity, and non-renewable resources—relevant communities (local, regional, national, or transnational) could, via accountable and elected bodies, be given a formal and material stake in the management of natural services and resources. Although this may seem idealistic, it is more realistic than assuming that the management of resources can be ecologically sustainable and more equitable when under the control of TNCs, "free markets," or global institutions. Only citizens who are given a formal and material stake in the management of environmental services and resources, executed through elected and accountable agencies, are likely to provide the social basis and agency required to protect the environmental space on which their well-being depends.

Granting citizens' rights to environmental services and resources is, of course, unlikely to occur without considerable political conflict and battle. However, as this option offers potential benefits to all citizens (in variable measure with regard to different resources), it is more likely to attract popular support than alternatives that only stress the need to set limits, while expanding, in practice, the role and power of international organizations and businesses. The main point to be emphasized here is that, although advancing and legitimating democratic control over environmental space requires a global institutional framework, it can be realized only at lower levels of governance and by the agency of citizens who claim their rights to environmental space.

Conclusion

The notion of environmental space, based on the principles of the need to respect environmental limits and of sharing environmental resources equitably,

78. Bell, Gray, and Haggett 2005; and Toke 2002.

provides a basis for legitimating and strengthening global governance in at least three positive ways. First, it provides a cognitive framework for determining limits *and* for dealing with these more comprehensively and effectively at all levels of government. Second, the environmental space approach supports, notably at the global level, a more equitable distribution of access to and benefits from resources that are becoming increasingly scarce (because of ecological reasons and/or growing absolute scarcity). Third, the notion of environmental space can be used as a basis for designing and introducing institutions and processes that enhance democracy and community control over the use of resources.

Already, several instances of growing global agreement on the need to respect environmental limits can be identified. However, these developments are mostly confined to areas of environmental space that can be referred to as "common pool" resources, or in which alternatives are more or less readily available at relatively low cost. Creating international agreements on areas of environmental space that are owned and controlled by the business sector or governments, and that are strategically important or for which alternatives are costly or not readily available, however, appears problematic. With regard to the latter, environmental space is gradually but inexorably eroded through a process that may be referred to as the tragedy of serial depletion. With globalization, and in the context of dominant political and economic rationality, resources (and their substitutes) are eroded and ultimately depleted one-by-one, and from place to place, only to become regarded as problematic when total demand starts to outstrip supply on an ongoing basis. By then, ecologically sustainable resource management may no longer be feasible, or only at a much lower level of available resources.

Often, the erosion of environmental space leads to a sharpening of competition and conflict and the imposition of limits (including by force) that protects the position of the rich and powerful at the expense of the poor. To prevent these outcomes, it is necessary to enhance democracy. Enhancing democracy, from an environmental space perspective, implies not only extending the principles of liberal democracy to the global level but also creating institutions and processes that grant people, within appropriate ecological-geographical contexts, a material stake in and formal rights and control over specific areas of environmental space. Depending on the resource or area of environmental space, a variety of forms of economic democracy may be designed. Which forms may be more desirable and feasible is a question that is best addressed by analysis of the political-economic constellations associated with particular areas of environmental space or resources and the development of strategies and coalitions on that basis.

Ultimately, whether the potential to use the notion of environmental space in positive ways will be exploited depends on the building and strengthening of a basis of social support and agency aimed at realizing this potential. The prospects of building such a basis are likely to vary from resource to resource and from country to country. But given the linkages between resources

and countries, such support must also be built at the global level. This is a daunting task, but vital if the bleak and self-defeating scenario of the "securitization of environmental limits" is to be avoided.

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