

## *Debate*

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# **Taking Natural Limits Seriously: Implications for Development Studies and the Environment**

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### **ABSTRACT**

This article explores how thinking about ecological limits, thresholds and boundaries has evolved in the last few decades, and explores the analytical and political possibilities that emerge if development studies scholars engage with these ideas. It makes the case for an engaged political economy approach, which focuses on understanding how finite resources at a variety of scales are shared between the competing claims of different groups in society. The article suggests that, while the science of planetary limits is important, the most significant societal challenges are not about how close we are to the limits, but involve finding mechanisms to reconcile the difficult trade-offs that inevitably arise when we consider alternative human pathways in the present and the future. Choices are ubiquitous, even when there may be no immediate ecological tipping point, and a political economy perspective focuses on the ways in which humanity prioritizes different, often irreconcilable, objectives and interests in relation to the environment. The productive consequence of this thinking for development studies is the need for a renewed focus on the key issues that define prosperity and well-being, as well as the political and moral economy within which human society governs itself, and its relationships with nature.

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#### ***First unnumbered footnote***

I am grateful to Murat Arsel for his advice and comments on drafts of this article. Some of the issues in this article were explored in the Doran Annual Lecture for Population, Resources and Development, delivered at the Hebrew University of Jerusalem in March 2014, and I am grateful to the organizers and audience at the lecture for their insights and feedback.

## **INTRODUCTION**

The ‘environment’ broadly defined, remains somewhat neglected within development studies, despite a substantial increase in contributions to the field over the fifteen years since 2000. Undergraduate and postgraduate courses (with some notable exceptions) often ‘add on’ environmental issues as special lectures or modules, and there remains a tendency for those who are ‘grounded’ in the material and discursive struggles that define the discipline to consider the environment as an exotic special interest, a problem that manifests itself in societies that have the leisure to care about the natural world. For many, the more immediate problems of industrial development, of finding stable pathways to growth, or of redistributing the fruits of that growth equitably to ensure wider prosperity, appear to be much more pressing, and not really connected to ‘green’ issues, especially when these are characterized as being primarily about the protection of rare and endangered species, or concerned with long time horizons that are beyond the cognitive gaze of those who are dealing with the material deprivations and exclusions of the present. Underpinning such views are conceptualizations of the environment–development relationship as one that is inherently characterized by trade-offs: while environmental protection may be desirable, it involves the sacrifice of present-day production and consumption, thereby negatively impacting conventional measures of prosperity and well-being. Interestingly, this tendency manifests itself both in mainstream approaches to development studies, as well as in more heterodox contexts.

Intellectual traditions that challenge these trends include the growing field of political ecology, although much recent scholarship in this sub-discipline does not confine itself to issues in ‘development’, with an increasing focus on political struggles over the environment in the advanced industrial world. After a slow start, a rich tradition of research, publication and teaching on the ways in which concerns about ecology, nature and the environment, and how humans impact on these processes and are affected by them (and in their social relations with each other, in relation to nature) has emerged in recent years. The ‘mainstreaming’ of the environment can also be seen in the Sustainable Development Goals (SDGs), which are to be adopted later in 2015, in which at least six of the seventeen high-level goals deal directly

with environmental issues (water and sanitation; energy; sustainable production and consumption; climate change and its impacts; marine resources; and terrestrial ecosystems). In this expanded notion of well-being and prosperity, the environment and development are not necessarily in conflict, and the environment is seen as a constituent element of a broader definition of societal progress. However, the SDGs being more integrated, holistic and mindful of ecological concerns, it is somewhat symptomatic that the ‘environmental’ goals do not connect or directly underpin those that are associated with creating healthy, prosperous, just and dignified societies, potentially encouraging their compartmentalization in a separate silo, boxed off from the headline-grabbing targets on poverty, hunger, health, education and jobs.

Analytically, and politically, a closer integration of the ‘natural’ into our core thinking about development studies offers a number of important possibilities, which are explored in this article. In particular, the article argues that natural limits force a consideration of the fundamental questions that animate a political economy of development: how should scarce resources be allocated, to whom and by what process? How are choices made, by whom, and in whose interests? These questions are fundamental to an engaged understanding of environmental limits, and are central to contemporary concerns in development studies. If limits are taken seriously, development becomes a distributional issue, which needs to allocate the increasingly scarce ecological space that is available to humanity between competing alternative uses (and visions). The distributional struggle is, therefore, central — between rich countries and those that are materially poor; between the wealthy and the less well-off within countries; and between present and future generations.

## **NATURAL LIMITS AND CARRYING CAPACITY**

There has been a resurgence in scientific thinking which emphasizes the finite resources of the planetary system, and its ability to absorb the pollutants that emerge from human activity on earth. The earliest work in this tradition can be traced back to the 1960s, often characterized as the period when the ‘modern’ environmental movement emerged in the developed world, over concerns about risks to human health from pollutants (Carson, 1962),

and about the risks of over-population (Ehrlich, 1968) in a finite world (Meadows et al., 1972). In a development context, the 1972 Stockholm Conference was an important landmark, providing the first major recognition of the interlinkages between the environment and development agendas, but also renewing an emphasis on the substantial differences between the industrialized countries and the developing world in relation to environmental issues, in particular over whether natural limits could be seen as a reason to constrain aspirations for economic growth. The adoption of the principle of ‘common, but differentiated responsibilities’ at the Rio Summit in 1992 confirmed the need for sensitivity to the legitimate developmental aspirations of nations, and the need for significant commitments from the industrialized world, while acknowledging the need for challenging pathways towards sustainability (Chatterjee and Finger, 1994).

Work in the last decade demonstrates that, despite the adoption of the mainstream rhetoric of ‘sustainable development’, progress towards living within natural limits has been slow. The Millennium Ecosystem Assessment (MEA) was a large-scale scientific study of the existing evidence on the status of the world’s ecosystems (and associated human well-being), conducted by several hundred authors from over seventy countries (MA, 2005; Mooney et al., 2005). A headline finding of the MEA, which reported in 2005, was that approximately 60 per cent of ecosystem services evaluated in the assessment were being degraded or used unsustainably, and that this degradation was seen as causing significant harm to human well-being and a loss of natural assets and wealth to the global economy. The trajectory that the world was on was, by these trends, clearly not sustainable. Soon after, in 2006, the UK Treasury published its landmark review on the Economics of Climate Change (Stern, 2006), which estimated that the potential risks to the global economy of uncontrolled climate change ranged between 5–20 per cent of global GDP, over the period 2035–2050. In comparison, the associated costs of early action to avert the worst effects of climate change were estimated to be considerably lower. In an attempt to extend the same sort of economic reasoning to estimating the threats posed by the loss of ecosystems and biodiversity, *The Economics of Ecosystems and Biodiversity* (TEEB, 2010) was published in 2010. This report further operationalized the financial implications of the loss of ‘natural capital’, suggesting that by 2050 the annual loss of economic value of ecosystem services due to the degradation of biodiversity (relative to 2000) could be up to 7 per cent of GDP.

A new approach to understanding natural limits appeared in 2009, with the work of the Stockholm Resilience Centre on Planetary Boundaries, which sought to define a ‘safe operating space for humanity’, based on the intrinsic biophysical processes that regulate the stability of the earth system (Rockström et al., 2009). Going beyond these boundaries, this work suggested, would risk triggering abrupt or irreversible environmental changes which would create conditions that were no longer conducive to the long-term existence of human societies on the planet, threatening life on Earth. Of the nine boundaries identified in this work, the evidence suggested that three — climate change, the rate of biodiversity loss, and interference with the nitrogen cycle — had already been transgressed. An update to this work, just published in early 2015, confirms the importance of the Planetary Boundaries framework, but recasts the details slightly, in terms of the data and evidence. Confirming the earlier findings, the 2015 study suggests that four of the boundaries — climate change, loss of biosphere integrity, land-system change, and altered phosphorus and nitrogen biogeochemical cycles — have been crossed due to human activities (Steffen et al., 2015).

In the same year as the first Planetary Boundaries study (2009), the idea of interlinked environmental and social processes converging to threaten human existence was encapsulated in the UK Chief Scientific Advisor’s phrase, ‘The Perfect Storm’ (Beddington, 2009). He argued that, in the context of climate change, increasing population and growing levels of urbanization, along with the desire for economic prosperity to alleviate poverty, were likely to lead to simultaneous pressures on the basic materials that were required for human survival. Projections suggested that, by 2030, demand for food, water and energy would increase by 40 per cent, 30 per cent and 40 per cent respectively. The concept introduced the idea that these drivers, operating together, potentially posed a greater combined threat to human survival than any one factor considered in isolation.

What has emerged from this new wave of environmental research is a much more sophisticated approach to understanding how natural processes evolve, and the risks that this might pose to human society. It is now recognized that ecological processes do not always follow a smooth path to degradation, and there are complex, non-linear dynamics associated with these systems (Hughes et al., 2013). It is not always possible to model or predict the

behaviour of the system, as this depends on the nature of the underlying processes, as well as how close the system might be to a critical threshold, or boundary. In such systems, it is not always known what trajectory is being followed, and gradualism and incrementalism (as is currently the case with responses to most environmental challenges) might not be a good strategy if the system is close to a critical threshold. More fundamentally, the Planetary Boundaries work has been challenged by those who question the arbitrary way in which quantitative limits have been assigned to earth system processes that are not yet near threshold conditions (Nordhaus et al., 2012). While all the processes that have been identified by this body of work are important determinants of the conditions that sustain life on earth, it is the ways in which they are managed that really matters for questions of human well-being, justice and shared prosperity.

There is little evidence of any likelihood of more fundamental shifts in current production and consumption patterns across the world, despite the mounting ecological evidence. Part of the challenge, as recognized by the 2015 Planetary Boundaries 2.0 research, is that these aggregated frameworks do not adequately account for regional variations, or for historical patterns, and they are not well equipped to address deeper questions of equity, which underpin many of the fundamental concerns in development studies. The responsibility for the patterns of production and consumption that put the world on unsustainable ecological pathways is unevenly distributed between different societies and social groups (typically, those who are more industrialized and wealthy bear the greater share of responsibility), while the benefits and costs from exceeding planetary boundaries are also not uniformly shared (with many of the costs impacting groups that have typically contributed little to the problem and are already most vulnerable). This contributes to the current impasse: even where there is recognition that current developmental pathways may be ecologically unsustainable, it does not follow that there is sufficient (political) consensus for fundamentally re-thinking the basic tenets of developmental processes that have dominated the last seventy years of thought in the discipline.

Responding to this apparent deadlock, De Fries et al. (2012) make the case for a shift of focus to ‘planetary opportunities’ — a view that accepts the limits set by the Earth’s life support systems on the conditions for human survival, but also recognizes the ways in which societies

react to, adapt, evolve and overcome these boundaries to address negative environmental consequences. While global analyses, global scientific assessments and global models provide an essential building block for effective responses, they need to be combined with work at smaller spatial scales (regional, national and local) to have an influence on decision making and societal choices. There is a need to move from the top-down vision that is implied by the planetary scale of analysis to a more grounded approach, which is cognisant of the ways in which people respond to limits at local scales, and construct solutions that address local needs. In a similar vein, Castree et al. (2014) argue that scientists working on global environmental change need to engage more directly with insights from the environmental social sciences and humanities, in order to actively explore more pluralist conceptions of the planetary present and its likely futures, which reflect the diversity of values, perspectives and aspirations that characterize human society.

## **BRINGING PEOPLE BACK INTO THE DISCUSSION OF NATURAL LIMITS**

Recent projections suggest that the world's population is likely to stabilize at somewhere between 9 and 10 billion people by the end of this century (Roberts, 2011). This is, of course, expected to add substantial pressure to a world that is already pushing at the boundaries of ecological (un)sustainability. Inevitably, bringing aggregate population into the discussion brings us back into a Malthusian realm, where human numbers push against the limits of both nature and human ingenuity — with the evidence so far suggesting that humanity has (just about) coped, but this is not necessarily a reason to be sanguine about the impacts of future population increases.

Much of the detail of what will happen to aggregate numbers depends on long-term fertility trends in the twenty-first century, in particular, how low these will fall once a society goes below replacement levels of fertility (Roberts, 2011). There is an in-built demographic momentum, and it is very likely that we will reach 8 billion by the middle of the 2020s, having crossed 7 billion in 2011. Whether the world will then stabilize closer to 9 or 10 billion by 2100 is still somewhat unclear. If fertility continues to decline well below replacement levels (as is currently the case in Japan, and some parts of Europe, but also in

some regions of the developing world, including some Indian states), then the world might experience less catastrophic demographic futures. While 10 billion remains a possibility, there is at least a very real prospect that human populations will peak at a lower level — and this difference is both material and important.

More generally, though, there is no question that there will be many more people inhabiting the planet at the end of the twenty-first century than there were at the beginning of the century. They will also, in almost all cases, be more affluent, and will aspire to better levels of material well-being, with associated increases in consumption (if current trends continue). This suggests that both the demographic pressure, as well as the expected increase in average consumption per person, is going to increase demands on the planet, which are already unsustainable. The implications are usefully understood by returning to one of the fundamental ecological relationships first proposed by Paul Ehrlich and John Holdren, which is still a helpful way of understanding humanity's impact on nature. In this work, Ehrlich and Holdren (1971) suggest that human impact can be broken down into three components — population impacts (typically increasing), consumption impacts (also increasing, for most people) and the impacts of technology. Technology offers the potential to mediate the pressures that emerge from production and consumption, and holds out the possibility that improvements in our ability to increase material output will allow humanity to converge on developmental pathways that do not impose greater impacts on natural systems. This is, in effect, a de-coupling of development from nature, due to technology, and is one way to reconcile the competing aspirations of present and future generations for a constant increase in their material well-being within finite planetary boundaries (the Brundtland Commission's elusive goal of 'sustainable development'; WCED, 1987). This is the focus of industrial ecology, of attempts to move towards zero emissions growth trajectories, and associated transitions towards ecological modernization.

The technological challenges are immense, when we consider the scale of the increases in both population and consumption that are likely to take place in the next few decades. As the Royal Society's *People and the Planet* report (2012) argued, if 1.3 billion people are brought out of poverty in the next twenty years, their need for consumption has to be set against the ecological space that has been captured by the already-consuming 6 billion who currently live



above the poverty line. The concept of the ecological footprint — the ratio of consumption patterns to the ability of natural ecosystems to produce the material that the world consumes — helps to illustrate this very clearly. According to the *Living Planet Report* (WWF, 2014), current consumption is the equivalent of the output that could be sustained by one and a half planets each year, and if current trends continue, this is likely to increase to the equivalent of two and a half planets by 2050. This, by all accounts, is not likely to be sustainable, unless there is a stabilization of humanity's material impacts on nature, which is very likely to mean that some people need to reduce their (luxury) consumption demands in order to create the space for others to increase their consumption (of basic necessities).

The challenge, therefore, is more than technological — it is about the very idea of development itself. If ecological trends suggest that humanity will have to move away from a dependence on material growth as a basis for defining prosperity, and redefine new patterns of well-being which are not as dependent on ever-increasing material consumption, this potentially raises serious implications for how development strategies are pursued, and what the ultimate goals are for society in this ecologically-constrained world. More importantly, choices need to be made in such a constrained world about which types of consumption are acceptable, and for whom, and which patterns of over-consumption need to be curtailed, and by whom. Who gets to decide which types of development pathways are acceptable in a resource-constrained world, and how are these decisions fought over, negotiated and contested within an unequal global political economy?

## **IMPLICATIONS FOR GROWTH AND DEVELOPMENT**

There have been several high profile attempts to redefine well-being, and to shift global society away from its current path of ecologically consumptive growth. The Commission on the Measurement of Economic Performance and Social Progress, led by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi (2009), provided a blueprint for looking beyond GDP as a measure. Their work sought to redefine both current well-being, which includes economic resources, such as income, as well as non-economic aspects of people's lives, such as their feelings, their capabilities and the natural environment that they inhabit, and sustainability,

which depended on whether critical stocks of capital (natural, physical, human and social) were passed on to successive generations. This was, of course, one of the most recent of many attempts to redefine what matters when we look for indicators of human prosperity, but GDP and income-based measures remain in the forefront of public discourse. One challenge, of course, was that the Stiglitz-Sen-Fitoussi commission produced its report at the height of the recent financial crisis, at a time when most politicians were singularly fixated on economic recovery, narrowly measured. There was little appetite for a broader dashboard of indicators, or for looking at ways in which progress could be measured in more imaginative, and socially meaningful ways.

In a similar vein, Jackson (2009) has drawn attention to the importance of defining prosperity to include not just material well-being, but also social and psychological well-being. In his report to the UK's Sustainable Development Commission, again written at the time of the financial crisis, Jackson argues that questioning growth is not an 'act of lunatics, idealists and revolutionaries', but is essential to find a new way of living which involves a renewed sense of shared prosperity, and a commitment to fairness and flourishing in a finite world. Prosperity, understood in this way, goes beyond material concerns, and includes the quality of people's lives, the health and happiness of societies, the strength of human relationships and trust in communities, satisfaction at meaningful and dignified work and a collective sense of shared meaning and purpose. The report provided concrete proposals and recommendations that provided policy makers an opportunity to move towards this new vision, but these did not catalyse an alternative approach to economic management as a way out of the recent recession; growth remains the singular mantra of all major economies, dominating discussions in most decision-making circles over the last six years. De-growth remains, in this context, beyond the contemporary imagination of those who pull the levers of power in the global economic system.

Technical tools to measure a wider range of indicators, and aggregate them in a consistent way for comparative purposes, are available, and have become more sophisticated. The Inclusive Wealth framework defines development as depending on a number of critical assets, and defines well-being in relation to these assets, and their maintenance over time. The *Inclusive Wealth Report 2014* (UNU-IHDP and UNEP, 2014) covers data from 1990 to

2009–2010, and examines 140 countries, focusing on both natural capital and human capital. The findings are important — while 124 out of 140 countries experienced improvements in GDP per capita over this period, only eighty-five countries showed an improvement in per capita inclusive wealth. Natural capital declined in 116 out of the 140 countries, suggesting that unsustainable development trajectories were being followed in most countries, potentially reliant on the transformation of natural wealth into present consumption. These findings go some way to explain what has been labelled the ‘environmentalists’ paradox’ — the suggestion that measured human well-being has improved at the same time as there is growing evidence of ecological decline (Raudsepp-Hearne et al., 2010). The Inclusive Wealth approach demonstrates that conventional approaches to measuring well-being fail to capture the decline in natural assets that accompanies improvements in conventional indicators of development.

The importance of ecosystem services for human well-being is widely acknowledged, and our understanding of the instrumental role of the natural environment in poverty alleviation is growing. Many of the current debates are structured around the contribution of ecosystem services as inputs to the multiple dimensions of well-being, as conceptualized in the Millennium Ecosystem Assessment. Both negative and positive aspects of the relationship between poverty and ecosystem services have been identified (Adams et al., 2004; Wunder et al., 2014). Positive ‘win–win’ relationships between ecosystem services and multidimensional poverty include evidence on the reliance of the poor on natural ecosystems to provide livelihood supporting goods and services. However, ecosystems also deliver ‘dis-services’, such as pathogens on crops and crop-raiding wildlife. On longer timescales, poverty is regarded by some as a threat to sustainable ecosystem management (Barbier, 2010), and high reliance on natural resources has been argued to cause a poverty trap (Dasgupta, 2004).

Until now, most work on ecosystem services has emphasized objective contributions to well-being, especially in the context of ‘provisioning services’. Some recent contributions to the role of cultural services (e.g. Daniel et al., 2012; Rogers et al., 2012) expand the emphasis to include subjective elements, and ways in which the quality of the natural environment might impact on how people think and feel about their lives. Bhutan’s Gross National Happiness

Index, which builds on the Alkire-Foster method (Alkire and Foster, 2011), has environmental conservation as one of its four pillars and nine domains. This raises the intriguing question whether availability/access to the natural environment should be considered as a dimension of well-being in itself, and therefore be considered in well-being indicators and multidimensional poverty assessments (including those used to define the success of the Sustainable Development Goals post-2015). Well-being usually refers to a multidimensional state that includes both objective and subjective elements. Durraipah (2004) identified ten constituent aspects of the environment which he deemed essential for improving well-being and reducing poverty, ranging from provisioning services (food, water, energy, medicine) to regulating (disease and hazard control, safe living space, clear air) and cultural values (elements for spiritual practices, agency). Such a perspective requires that definitions of well-being expand to recognize the intrinsic links between the natural environment and subjective conceptions of the ‘good life’, and go beyond the narrow instrumentality that is contained within the mainstreaming of ecosystem services, the commodity fetishism that reduces ecosystems to tradable monetary values (Kosoy and Corbera, 2010) and their putative incorporation into the logic of financialized capital (Arsel and Büscher, 2012).

The fundamental challenge for development studies is how to create the space to improve prosperity, within these ecological boundaries. For many who have been denied the benefits of development, the challenge is the growth, not the limits. What environmental concerns bring to centre stage are deeper, more fundamental questions about the nature of growth itself. Growth is not just an overall aggregate property of the earth-economic system, but is differentially experienced, by different people and in different ways. This takes the debate away from the technocratic approach of industrial ecology towards a more distributionally-sensitive *political ecology* — what kind of growth will this be, for whom, decided by whom?

The difficulty with aggregated visions is that they take the focus away from specific problems, in specific places, which are the real concern for development. The injustice of unequal consumption patterns between and within countries forces attention on the material demands not of people in general, but of particular people in particular locations, and the systems of production and reproduction that sustain their relative positions in the hierarchy of

resource access and use. As Dorling (2013) has argued, the actual number of people who impact on natural ecosystems is not important — it is not how many we are, but how we choose to live. While the natural limits literature correctly draws attention to the big picture, the devil lies in the detail, the everyday lived realities, which characterize people's aspirations and desires for better futures. Inequality is manifest across almost all aspects of humanity's relationships with nature, whether it is the use of resources, or the polluting impacts of production and consumption processes.

The nature of capitalism — which captures both labour power and nature, and reshapes these in its own image — suggests that it is inherently incompatible with natural limits. As a system, capitalism needs to continually expand in its search for profit, and this relies on sourcing ever-cheaper raw materials, the systematic under-valuation of nature as a source of inputs as well as a sink for pollutants, and expanding the frontiers of production to previously under-exploited landscapes resulting in a spatial, ecological and social separation of humanity from the ecosystems that sustain it — a metabolic rift (Foster, 1999; Schneider and McMichael, 2010). The dominance of the owners of the means of production creates the contradictions and crises that undermine the system. Ironically, the process of financialization that has created the most recent crisis of capitalism has also consciously de-coupled profit from the material basis of the economy. Fictitious commodities allow the continued generation of profits in this casino economy, even without any material basis (Sullivan, 2013). In such a financialized world, the limits on material growth need have no necessary impact on profitability. Indeed, scarcity itself need not necessarily undermine the basis of the capitalist economy, which can cope with shortages by rationing through prices (e.g. urban water, which is increasingly only available to those who have the financial means to secure their needs). These attempts to green capitalism through the market have been described as an 'ongoing attempt to create fictitious win-win solutions out of real ecological limits and their uneven and unequal social impacts around the globe' (Arsel and Büscher, 2012: 67). Charging for scarce commodities and using prices to ration access excludes those who cannot afford to pay, but does not necessarily impact on the profitability of the water suppliers and distributors who control scarce resources, reinforcing inequality. A political economy approach to understanding the operation of this system highlights the winners and losers from these processes of enclosure and exclusion, and the incremental concentration of wealth and

power in the hands of the already-powerful, coupled with the dispossession of those who lack means and influence.

Paradoxically, the concentration of returns to capital and wealth on the small minority at the very top of the distribution also means that this does not allow well-being to spread more uniformly. This concentration is also, in itself, a potential cause for further crises of under-consumption and stagnant demand/growth (Morelli and Atkinson, 2015), which reinforce a policy focus on reinvigorating conventional growth, premised on the exploitation of nature (without addressing the underlying distributional inequality). The environment enters the frame as a constraint on such growth, reframing the debate as one of environment versus development, as has been witnessed in the the extensive lobbying of business groups against environmental laws in India in the last two years, and the apparently compliant regulatory environment that has been ushered in under the new regime in order to placate these strident voices. A false dichotomy is created between the needs of investment and capitalist expansion, and social and ecological concerns about the distributional and environmental implications of these strategies of accumulation by dispossession.

### **GOING BEYOND THE ENVIRONMENT VERSUS DEVELOPMENT DEBATE: ANALYTICAL AND POLITICAL POSSIBILITIES FOR DEVELOPMENT IN A WORLD WITH LIMITS**

Using the Planetary Boundaries framework as a point of departure, Raworth (2012) argues that the safe ecological space for humanity needs to be coupled with a fair/just space for humanity, in which the basic human deprivations are adequately addressed. This is the aspirational space for a progressive development studies, cognisant of ecological constraints and the need to share the finite resources of the world, but doing so by following viable pathways that combine a concern for the social context for prosperity with the safe ecological operating space for humanity.

In the conventional framing, poverty and environment are interlocked in a fatal, downward spiral, with poverty seen as both a major cause and effect of global environmental problems.

Poor people lack long-term time horizons, and poverty is therefore responsible for environmental harm. The solution, then, is growth — to break this pernicious downward spiral (World Bank, 1992). Growing out of poverty will provide the means by which environmental challenges can be addressed. What this way of constructing the problem does not address are the root causes of that poverty. Poor people are often forced into particular patterns of behaviour because they have very few resources, having been displaced, dispossessed or excluded from the means of production and from access to dignified and sustainable livelihoods (Borras and Franco, 2012; Wolford et al., 2013). However, social movements and progressive interventions demonstrate that there is considerable empirical evidence that the poor can and do care for the environment if given adequate resources and incentives (Gray and Moseley, 2005; Guha and Alier, 1997). By removing inequality and providing secure access and tenure, economic and ecological rationalities can converge towards more viable and sustainable patterns of production that conserve and enhance inclusive wealth, not just material growth (Shrivastava and Kothari, 2012). Reclaiming ecological autonomy and the ability to make decisions means that local community groups have longer-term perspectives that allow them to act in ways that protect and enhance natural systems. There is considerable evidence that the decentralization of decision making increases equity and inclusion while enhancing sustainable management of natural resources (Ribot and Larson, 2005). Equally, it is important not to over-romanticize the possibilities of these decentralized systems, which tend to homogenize local communities and depoliticize the everyday realities of conflict and negotiation over the access and management of natural resources (Hall et al., 2014).

There is growing evidence that the poor feel the impact of natural resource loss disproportionately, whether this is due to the long-term degradation of natural resources (driven by external factors which are not under their control), or the catastrophic consequences of extreme weather events. In studies that examine environmental income (Angelsen et al., 2014), there are clear patterns which suggest that the lowest quartiles are those which depend most on nature for their livelihoods. When natural disasters strike, those who are hit first, and hardest, are the poor and the already vulnerable (Royal Society, 2014). This has important implications for development studies. Taking this seriously means that protecting and restoring the environment can be a powerful targeted measure which

disproportionately serves the interests of the least well-off, if the poorest groups can be provided secure access to the benefits from such efforts. To realize these opportunities, those who are excluded have to be empowered and given voice, and greater local control over the governance and management of resources. Far from the environment versus development framing, there are powerful synergies between the environment and development agendas, and restoring the environment can be seen as an anti-poverty measure, one which re-embeds the economic within social and ecological processes.

Environmental change does not impact universally on an undifferentiated mass of humanity, but typically involves winners and losers. When resources become scarce, the real question is who gets to allocate these resources, to whom and on what basis? Similarly, when new resources become available, the distributional question is important. Many environmental changes that are perceived as improvements involve hidden costs that are visited upon particular groups, who may lose access to customary resources due to weak and insecure tenure, or be excluded when decisions about allocation are made. Rarely, if ever, are there any opportunities for win-win, and the political economy challenge is to identify the hidden losers who are not always evident when environmental decisions are made in the context of coping with aggregate limits.

It is important, therefore, to be aware of the ubiquity of choice which is essential to understanding how limits matter when we consider the role of the environment in development studies. The key questions involve reconciling competing claims around scarce resources, going beyond a technocentric focus on aggregate boundaries, thresholds and limits — which are important to frame the context for the discussion, but not always helpful when considering what must be done, and by whom, in whose interests. Thinking about limits does not remove the moral choices that are involved in development; if anything these become even more central. As the finite natural world constrains the possibilities of ever-expanding consumption for all, it forces development studies to engage with these choices in very real ways: how should we live, and who gets to decide?



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