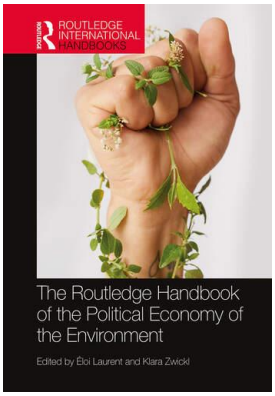

The Routledge Handbook of the Political Economy of the Environment

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Conclusion

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CONCLUSION
New frontiers in the political economy of the environment

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From biophysical limits to social-ecological frontiers

The blind spots identified in the introduction of this handbook have been individually addressed with each chapter's contribution in a powerful and original way. This fills the void left by the lack of collaborative efforts to bridge political economy and environmental economics. The collective picture formed by these chapters leads us to conclude that an important next step will be the development of a robust and consistent framework connecting ecological crises to social systems. This consolidated approach could help strengthen the discipline of political economy of the environment.

One way to start thinking about the task standing before us is to consider the value and limitations of existing frameworks that have recently attempted to represent the magnitude of global environmental change. Certainly, the most influential representation of our unprecedented time is the model of "planetary boundaries". Planetary boundaries are quantitative thresholds "within which humanity can continue to develop and thrive for generations to come" (Steffen et al., 2015: 1). Crossing these boundaries would amplify the risk of generating large-scale abrupt or irreversible environmental and social changes. The authors warn us in unambiguous terms about this peril: "Four of nine planetary boundaries have now been crossed as a result of human activity: climate change, loss of biosphere integrity, land-system change, and altered biogeochemical cycles (phosphorus and nitrogen)". Two of these, climate change and biosphere integrity, are "core boundaries", hence, significantly altering either of these would "drive the Earth System into a new state" (Steffen et al., 2015: 1).

While this is certainly breakthrough science, classical economists from the 18th and the 19th century had the intuition that human development was in fact constrained by the scarcity of nature. More importantly, planetary boundaries seem to be silent on human frontiers: who is responsible for ecological trespassing? Who is vulnerable? Similarly, the Anthropocene theory presents us with a unified human species that has set in motion a geological revolution, to the perverse effects of which all humans are now exposed. However, this is clearly misleading, in terms of both analysis and policy: to borrow from UNFCC language, if humans share a common responsibility in setting global environmental change in motion, this responsibility is highly differentiated (U.N., 1992).

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As a result, we would like to argue here, in light of the information presented in each chapter of this volume, that the notion of social-ecological frontiers, rather than planetary boundaries, offers a more meaningful framework for studying the political economy of the environment. In other words, the conceptualization of "boundaries" should be extended to consider limits determined not only objectively by chemistry or biophysics, but also normatively by principles of justice. As the chapters gathered in this handbook make clear, ecological crises are social issues, in which the central question should be to understand which social causes generate ecological damage and crises and which social consequences they in return induce on social systems and human groups.

The case of climate change illustrates the need for such an approach. The 1.5 to 2 degrees limit of warming mentioned in the 2015 Paris Agreement[1] is indeed a chosen threshold and not an imposed limit – a threshold designed by humans that will determine the fate of hundreds of millions of people in decades to come. In addition, the COVID-19 pandemic, which is very likely a zoonosis, shows us that the human-animal limit itself is a moving and porous frontier that depends on the expansion of human systems in the biosphere (WHO, 2020). If the "one health" approach offers insights into the contemporary outburst of pathogens transmitted from animals to humans, it is precisely because it posits that there is no boundary between humans and animals (WHO, 2017). More generally, it could be that planetary boundaries might be better understood and respected by human societies if they are conceived as social-ecological frontiers endowed with social values and justice principles.

However, "new frontiers" has a more precise meaning within this general framework, referring to the new domains that are emerging in relation to the political economy of the environment. Specifically, we see four such domains that are not sufficiently covered in this volume.

Ecological and digital transitions: friends or foes?

The first such domain is the emerging contradiction between the reality of digital transition and the necessity of ecological transition, which could be thought of as the political economy of conflicting transitions. The state of California represents a compelling example of this growingly visible contradiction. California is home to two types of exceptional ecosystems: natural ecosystems and digital ecosystems. While the region has become the center of global tech capitalism, it is also a region where, in the last 20 years, natural ecosystems have entered a structural crisis (water, forests, air quality, drought, etc.). In other words, while digital ecosystems are flourishing (e.g. Apple is now worth more than the entire French stock market and will soon surpass the GDP of France), natural ecosystems are floundering (Bradshaw & McGee, 2020). Is there a contradiction or a convergence between natural and digital ecosystems? One way to answer this question is to look at the extraction of natural resources that has accompanied digital transition.

The world economy currently extracts three times more natural resources than it did in 1970. Furthermore, the early 2000s and the mid-2000s, when the digital transition really took off, marked an acceleration in extraction patterns (40 billion more tons were extracted between 2000 and 2017 in comparison to the 20 billion tons extracted between 1970 and 2000) (IRP, 2017). Even more striking, the relative decoupling between economic production and consumption of natural resources observed throughout the 20th century and up until the early 2000s has since been reversed (Laurent, 2020a: 92). But why? And with which consequences for whom?

Social-ecological urban environmental justice[2]

The beginning of the 21st century is characterized by two large-scale geographical dynamics. The first is the global urban revolution that began in the second half of the 20th century. Whereas in 1700 only 2% of the planet's inhabitants lived in cities (and then 3% in 1800), this proportion rose to 15% in 1900 and then doubled to reach 30% in barely 50 years, with the 50% threshold having been crossed in 2007 (U.N., 2019). In 2018, according to figures published by the United Nations, 55% of the world's population lived in urban areas (U.N., 2019). Interestingly, this trend can also be observed in terms of the size of cities. This is to say, in the 21st century, the growth of urban spaces has been twice as fast as that of the world population. Thus, demographic experts predict that the physical expansion of the world's cities during the first three decades of the 21st century will surpass that of all urban spaces from the origins of the human species until the end of the 20th century (U.N., 2019). In the short term, the urban population, which was roughly 4.2 billion inhabitants in 2020, is expected to reach 5.1 billion by 2030 (or about 60% of the world population), with almost half of that increase occurring in urban spaces that have more than one million inhabitants (U.N., 2019).

This dynamic of urbanization is clearly global, and thus, one can speak without hyperbole of a universal urban revolution. Of course, not all regions of the world are equally urbanized, but they are converging toward urbanization at a rapid rate. Leading the urbanized regions are North America (with 82% of its population living in urban areas in 2018), Latin America and the Caribbean (81%), Europe (74%), and Oceania (68%) (U.N., 2019). Conversely, India has the largest rural population (893 million), followed by China (578 million), while African nations remain predominantly rural, with only 43% of their population living in urban areas (U.N., 2019). However, both Asia and Africa are expected to account for 90% of urban population growth over the next three decades. The case of Nigeria, whose population became predominantly urban in 2018, is a compelling case study of the global convergence towards urbanization. While the country had less than 10% of its population living in urban areas in 1960 (three times less than the global average), it is anticipated that by 2050 this figure will rise to 70%, the same level as the world average (U.N., 2019).

A stylized fact, resulting from the two previous trends, is that environmental sustainability is now an urban issue. As the urban revolution accelerates before our eyes, cities are now recognized as key places for both mitigation of and adaptation to ecological crises, starting with climate change. In particular, cities hold the key to the necessary reduction in the consumption of natural resources, which causes considerable damage to biodiversity and ecosystems and increasingly affects depopulated rural areas. While they only occupy 5% of the planet's surface, cities represent 66% of the energy consumed and 75% of CO_2 emissions (Laurent, 2020a: 173). According to the International Energy Agency (IEA), buildings alone are the largest source of energy consumption in the world (Laurent, 2020a: 173).

As surprising as it may seem given the salience of these dynamics, there is still no formal, universally accepted definition of what a city is. There is therefore, *a fortiori*, no consensus on what a sustainable city would be, nor what a just and sustainable city would entail.

The political economy of cities is of course nothing new. City dwellers are citizens in places: a city is by definition a politicized space, a domain defined by the legal authority under which it is placed by a human community. It is therefore a place of justice between humans. Thus, if Latin distinguishes *urbs* (the physical space) and *civitas* (the community of citizens), the Greek *polis* means both the city and the political community. The legal space thus defined determines in turn the social prospects of the people who occupy it. Social injustice is thus reflected within

space (through the spatial inscription of social inequality, such as the striking racial segregation of the city of Detroit); spatial organization generates injustice (the spatial creation of social inequalities, such as the externalization of industrial risk in the poorest departments of the Ile-de-France region around Paris); finally, social relations, in particular inequalities, produce space.

Social sciences took up the question of urban justice in the 1920s and 1930s, with the development of the "urban ecology" approach by the sociological school of Chicago, which was particularly interested in the influence of spatial factors on social phenomena. The first appearance of the concept of "spatial justice" in academic literature dates back to the pioneering work of David Harvey in the early 1970s (Harvey, 1973).

However, we are presented with new and evolving urban realities in the face of ecological crises. At the start of the 21st century, the discussion/issue of urban spatial justice seemed to align with the overall goals of environmental justice, at all levels of governance of cities. Natural elements, deeply altered by humans, give rise to a new, third, type of inequality, which is neither natural nor social but rather socio-ecological. While heat waves linked to climate change are certainly natural phenomena, it seems that in the 21st century these are exacerbated by harmful human activities (via climate change) and thus, their social impact is in turn considerable (e.g. 70,000 dead in Europe and nearly 15,000 in France after the 2003 heat wave) (Robine et al., 2007). These inequalities are thus socio-ecological in nature, both upstream and downstream.

In fact, the major challenge for developed cities at the start of the 21st century is no longer, as it was in the 18th and 19th centuries, the problematic proximity of places of residence and production sites. Rather, it is the problematic distance between employment and residential areas leading to constrained mobility, which generates unequal local and global pollution and the ecological vulnerability of urban spaces (in which almost the entire population is concentrated).

Similarly, while one of the aims of a city is to protect against natural disasters, it might just as well expose its residents to greater risk, as is the case with flooding. "Hydrometeorological events" (such as floods and storms) constitute the social-ecological risk affecting the greatest number of people in the world and represent two-thirds of the costs linked to so-called natural disasters in Europe. By way of illustration, the "natural" shock of the June 2013 floods (the most serious in recent decades on the continent) was considerable: a 10-year flood along the river plain of the Danube, the Elbe, the Saale, and the Vltava, affecting Germany, Austria, Hungary, the Czech Republic, and Slovakia. In fact, it is the human factor that explains the scale of the disaster, since increased urbanization entails the artificialization of soils and thus degradation or even inversion of their flood regulatory capacities. The flood risk is not natural but results from the combination of exposure and sensitivity of populations. Therefore, social-ecological analysis and policy may have a great future in the 21st century.

Toward a comprehensive assessment of the distributional impacts of environmental policy

Another important avenue for further research in the field of political economy of the environment is the development of a broader framework to understand the distributional effects of environmental policies. The field of environmental justice distinguishes between different types of environmental inequalities, for example Laurent (2011) distinguishes between four types: exposure and access inequalities, policy effect inequalities, environmental impact inequalities, and policymaking inequalities. Yet, most empirical studies in the field of environmental justice focus on exposure and access inequalities, while some environmental economists have become increasingly interested in assessing policy effect inequalities, for example the distributional impacts of carbon taxes (see Boyce, chapter 17). Currently, very limited evidence exists on

how an environmental policy would affect both or all of the four dimensions of environmental inequality. Theoretically, it is possible that an environmental policy reduces all of the aforementioned categories, or reduces some but increases other dimensions of inequality. Thus, the broader our analysis, the more likely we can assess the overall distributional effects. Such a broad framework could build upon different streams of literature discussed in this handbook with the aim of integrating them into a comprehensive analysis.

Economic theory, policy discourse, and the public perception consider environmental policies, especially price-based policies, to be regressive. A carbon tax, for example, increases the price of energy, which disproportionately affects low-income households since they spend a larger share of their income on energy consumption. Thus, while an analysis limited to the consumption effects of environmental policies will thus likely find regressive effects, the broader and more outcome variables that are included, the more likely it is that the overall effect will be reversed. If only the impact of carbon pricing on a specific carbon intensive sector is analyzed, then the employment or output effects are likely to be negative. This however neglects that job-shifting from carbon intensive to less carbon intensive sectors can occur and that overall employment effects might thus turn positive (see for example Yamazaki (2017) who found this for the carbon tax introduced in British Columbia). Moreover, carbon pricing can increase the cost of capital and therefore may lead to a substitution from capital to labor, which in turn leads to a rising wage share (Metcalf, 2019). Carbon pricing also generates revenues that can be recycled progressively (see Boyce, chapter 17).

These examples suggest that the broader the assessment, the more likely it is that the carbon tax is found to yield overall positive economic and distributional effects. Yet, the current literature is still largely focused on economic variables. However, different strands of literature – the aforementioned literature on the economic and distributional impacts of environmental policies, the literature on environmental justice and climate justice, and the literature on co-benefits of environmental policies – could be combined to develop a framework to conceptualize and measure the full distributional impacts of environmental policies.

The literature on environmental inequality provides strong evidence that environmental goods and bads are distributed unequally across society. Various chapters in this handbook emphasize the fact that poor and minority neighborhoods often face higher pollution burdens and associated adverse health effects, in addition to being more vulnerable to the health effects of pollution due to lower access to health care (for example Laurent in chapter 3, and Pellow in chapter 6). Poor households are also more often affected by natural disasters, and when they are, their assets are disproportionately more affected than those of rich households (see Hallegatte and Walsh in chapter 8). Conversely, policies that reduce these environmental burdens would have positive redistributive effects on health, productivity, and asset values. However, little empirical evidence currently exists on the effects of environmental policy on the distribution of these outcomes. One would expect that if environmental policies improve environmental quality, the health effects of these environmental improvements would disproportionately fall on socioeconomically vulnerable populations that have faced high levels of pollution in the past.

Similarly, the literature on air quality co-benefits emphasizes the existence of substantial and significant positive spillovers of climate policy on public health through air quality improvements (see Zwickl and Sturn, chapter 13). However, public health benefits are typically aggregated across the whole economy and not differentiated by income or socioeconomic status. The only two exceptions in the literature are Boyce and Pastor (2013) and Cushing et al. (2018), who find that incorporating air quality co-benefits into climate policy in the US could also narrow environmental inequality, since co-benefits are highest in socioeconomically disadvantaged

neighborhoods. More empirical research linking co-benefits, environmental inequality, and the distributional effects of climate policy would be very beneficial.

Developing a broad concept of the distributional effects of environmental policies becomes even more challenging when future generations are also considered, when intergenerational inequality is added to intragenerational inequality. While current climate policy still focuses on climate change mitigation, the reality is that the longer we take to reduce carbon emissions, the bigger the need for climate change adaptation will be in the future. Although some adaptation measures can be very costly now, they will be crucial for the survival of millions of people in the future. Thus, when assessing the distributional effects of climate policies, we should also consider that they will result in fewer adaptation measures, which in turn will bring along new challenges of allocation among competing needs in society.

Understanding the belief structures of environmental policy

This handbook has emphasized that ecological crises are social issues, while also presenting environmental degradation in the light of power inequality. Many articles explicitly or implicitly deal with the question of which power constellations maintain and reinforce current environmental degrading activities (for instance Sicotte in chapter 11 and Cardenas in chapter 12). Sometimes, however, social norms, attitudes, and beliefs could result in outcomes in which the majority of the population would benefit from an environmental regulation but individuals and groups still harbor strong negative views against the considered measure.

These norms, attitudes, and beliefs vary across countries and time. In fact, sudden changes in public opinions are especially common for environmental issues, since on the one hand environmental conservation is considered desirable by many, but on the other hand environmental policies are often viewed as socially regressive for the reasons discussed in the previous section. Many trade-offs are thus constructed in the political discourse, such as between environmental and social goals, or between different environmental goals.

An interesting case to examine is nuclear energy. Attitudes towards nuclear energy vary substantially across countries and over time. One country with strong negative views on nuclear energy is Austria. In a nuclear referendum in the late 1970s, the (small) majority of voters objected to the launch of the already constructed first and only nuclear power plant in Austria (which to date still exists and now produces solar energy). While nuclear energy was still strongly contested in the early 1980s, the Chernobyl nuclear disaster of 1986 lead to a near consensus against nuclear energy in the Austrian society, with no political party promoting it ever since (though Austria imports nuclear energy from other European countries). In contrast, in the United States, nuclear energy is widely used and even advocated for by some environmental policymakers, who promote nuclear energy as an important alternative to carbon combustion (or at least as a transition technology). Other countries fall somewhere in between Austria and the US. However, public perceptions change, as they have after nuclear disasters (e.g. Germany decided on a nuclear phaseout in 2011, shortly after the nuclear disaster in Fukushima) or when an inevitable trade-off between the threats from nuclear energy and the threats from climate change receives wide public attention. The latter can explain why in Switzerland a popular initiative to phase out nuclear power in 2016 initially expected strong support; however, within only eight weeks, support in favor of the phaseout dropped from 60% to around 46% (Rinscheid & Wüstenhagen, 2018).

An even stronger change in public attitudes in a popular vote can be found in California's rejection of "The California Right to Know Genetically Engineered Food Act" in 2011. The new law would have required the labelling of genetically modified food products, a proposition

initially enjoying a large – up to 90% – support by people wanting to know – and thus decide – whether they were eating genetically modified foods. Prior to the election, a large campaign funded by producers of genetically modified organisms (GMOs) successfully reframed the debate (with the help of a budget that was five times as big as that of the supporters of the initiative) (Paull, 2012). In this case, an argument used by the opponents that ultimately shifted the election outcome was that an additional label on every food product would unnecessarily confuse consumers, given that food products already require other labels, including information on nutrients. The vote was lost 47% to 53%.

The previous examples suggest that the framing of an environmental goal and the economic, social, and distributional consequences of achieving it strongly affect political processes and popular views, often at the expense of more stringent policies. Hence, this should be considered in the field of political economy of the environment.

Moreover, the perceptions and actual distributional effects of policies may differ substantially. A large-scale French survey on the attitudes on climate change and policy found that the French generally prefer regulations or green public investments over a carbon tax, because they perceive the latter to have strongly regressive effects (Douenne & Fabre, 2020). In fact, regulations, for example mandatory technology requirements, might lead to price increases similar to a tax but without the advantage of the tax generating a revenue that can be distributed progressively. In the previous section we hypothesized that the broader the economic, social, and environmental outcome variables that are measured, the more likely it is that an environmental policy is considered to have positive distributional effects. This section illustrates that it is not only necessary for the field of political economy of the environment to empirically assess this, but it is also necessary to communicate the findings to a broader public audience. It also illustrates the centrality of narratives in human behaviors and should lead us, finally, to extend the definition put forth in the Introduction of this volume: the political economy of the environment should also be concerned with narrative power inequality.

Notes

1 Article 2a of the Paris Agreement states the objective of "Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change".

2 This section is adapted from Laurent (2020b).

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