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Political Economy of the Environment: A Look Back and Ahead

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Political Economy of the Environment: A look back and ahead

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Abstract: The political economy of the environment aims to deepen our understanding of the interplay among the economy, the environment, and human well-being. In contrast to neoclassical environmental economics, it pays attention not only to the net magnitude of costs and benefits but also to their distribution. In the realm of positive analysis – descriptions of how the world works – this means exploring the multiple ways in which the distribution of wealth and power affects environmental outcomes. In the realm of normative analysis – prescriptions for how the world should work – political economists advocate a range of criteria including not only cost effectiveness but also safety, sustainability, and environmental justice.

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Political Economy of the Environment: A look back and ahead

Environmental economics extends the purview of economic inquiry beyond items that carry price tags in markets – the goods and services that count in measuring national income – to include non-marketed attributes of our natural environment such as clean air, clean water, biodiversity, and global climate stability. This is founded on growing recognition of the environment's crucial role as a source for raw materials and as a sink for the disposal of wastes generated in economic activities.

If economics is defined as being concerned with the allocation of scarce resources among competing ends – a common definition found in textbooks – then environmental economics widens these competing ends to encompass the protection of natural resources and environmental quality.

Political economy analyzes the allocation of scarce resources not only among competing ends but also among competing individuals, groups, and classes. The political economy of the environment extends the purview of environmental economics beyond the allocation of scarce resources among competing market and non-market ends to their allocation among competing people.

In analyzing environmental degradation, the political economy of the environment poses three basic questions:

- *Who wins?* Who benefits from economic activities that degrade the environment? If no one benefits (or at least thinks they do), these activities would not occur.

- *Who loses?* Who is harmed by environmentally degrading activities? If no one is harmed in current or future generations, these would not matter from the standpoint of human well-being.

- *Who decides?* Why can the beneficiaries of these activities impose environmental costs on the people who are harmed by them?

This analytical framework has both a positive agenda and a normative agenda. The aim of positive analysis is to describe what happens and why. The aim of normative analysis is to prescribe what should happen. In both respects, the political economy of the environment departs from neoclassical economics.

Inequality and the Environment

There are three possible reasons why those who benefit are able to do so by imposing environmental costs on others. One possibility is that the winners are here today, whereas the losers are future generations who are not here to defend themselves. The second is imperfect information: those who are bear the costs may be unaware of the harm or unaware of its causes. The third possibility is inequality: those who bear the costs do not have sufficient purchasing power or political power to prevail in social contests over use and abuse of the environment.

In the first case, addressing environmental degradation requires an ethic of inter-generational responsibility on the part of those of us who are alive today. In the second, the remedy is environmental education, and in particular right-to-know laws that protect the public's right to information about environmental harms and who is responsible for them. In the third case, the solution lies in a redistribution of power.

Power and social decisions

Both purchasing power and political power are implicated in environmental decisions. Purchasing power underpins the monetary valuation of environmental harms in cost-benefit analysis, just as it underpins consumer demand in actually existing markets for goods and services. In cost-benefit analysis, and in markets, each dollar – not each person – counts equally. Costs and benefits that go to people with more dollars receive greater weight than if they go to people with less.

Political power matters, too. Decision-makers do not necessarily attach to the same importance to all benefits and costs as measured by cost-benefit analysts. When the people who are harmed have no political power, costs imposed upon them can be simply ignored. This is not merely a hypothetical possibility. It was illustrated in 2017 by the U.S. Environmental Protection Agency's decision to assign *zero* value to climate-change impacts outside the United States in mounting a cost-benefit case to repeal an Obama-era policy that would have curbed carbon emissions from power plants.[1] But even among those who are not excluded entirely from the political process, power often is distributed quite unequally.

Both sorts of power – purchasing power and political power – tend to be correlated. Those with more wealth typically wield more political clout, and vice versa. The joint effect can be described by a power-weighted social decision rule, in which environmental outcomes are shaped by inequality in the distribution of wealth and influence (Boyce 1994).

Two predictions follow. The first is that the distribution of environmental costs will not be random. Instead, risks and harm will be inflicted disproportionately on those with less economic wealth and less political power. The second is that wider inequalities will tend to result in higher levels of environmental degradation. Both propositions – one on the direction of environmental costs, the other on their magnitude – have been supported by the growing body of research on the political economy of the environment carried out in the past quarter century.

[1] See Mooney (2017) and Boyce (2018).

Inequality and the direction of environmental harm

In the United States, environmental justice researchers have documented systematic disparities in exposure to hazards along the social fault lines of race, ethnicity, and class. African-Americans, Latinos, and low-income communities are more likely to have hazardous facilities sited in their midst and more likely to face disproportionate exposure to pollution.

One of the earliest studies, by sociologist Robert Bullard (1983), examined the distribution of hazardous waste sites in Houston, Texas, revealing that they were located primarily in African-American neighborhoods. Subsequent research has found similar patterns in many parts of the country. Multivariate analyses have found that race and ethnicity are strong correlates of proximity and exposure, even after controlling for neighborhood income; indeed, these are often a stronger predictor than income.[2]

Researchers have investigated the direction of causality that underlies these correlations. Are hazardous facilities sited from the outset in communities with less wealth and power, or do post-siting demographic changes explain the pattern, as wealthier residents move out, property values decline, and poorer people move in? Time-series data on hazardous facilities are not readily available, so few studies have explored this question directly, but those that have done so have found compelling evidence of disparities in the initial siting decisions.[3]

Researchers also have begun to explore the economic and health consequences of these environmental disparities. Disproportionate pollution exposure has adverse effects on children in particular, resulting in higher rates of infant mortality, lower birthweights, a higher incidence of neurodevelopmental disabilities, more frequent and intense asthma attacks, and lower school test scores. And among adults, pollution exposure is linked to lost work-days due to illness and the need to care for sick children.[4] These effects exacerbate the vulnerabilities that make some communities more susceptible to environmental harm in the first place.

Environmental inequalities are not unique to the United States. In England and the Netherlands, poorer and more non-white neighborhoods have higher air concentrations of particulate matter and nitrogen oxides (Fecht *et al*. 2015). In Delhi, India, a mega-city whose residents breathe some the world's dirtiest air, not all are equally exposed: the poor live in more polluted neighborhoods, they cannot afford air conditioning or air purifiers, and they spend more time working outdoors where pollution levels are higher, and at the same time they receive fewer benefits from the power generation, transportation and other activities that cause the pollution.[5]

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[2] See Mohai and Saha (2015a); Zwickl *et al*. (2014); and Bullard *et al*. (2008).

[3] See Mohai and Saha (2015b) and Pastor *et al*. (2001).

[4] For a brief review of relevant literature, see Boyce *et al*. (2016).

[5] See Garg (2011); Foster and Kumar (2011); and Kathuria and Khan (2016).

Although most research on environmental justice has focused on race, ethnicity, and income, power disparities in other dimensions may have environmental consequences, too. In some cases, for instance, particularly activities involving resource extraction or solid waste disposal, rural areas may suffer disproportionate environmental harm compared to urban areas (Kelly-Reif and Wing 2016).

To take another example, gender-based inequalities may translate into disparate environmental harms inflicted on women. The prime example, perhaps, is the exposure of women to indoor air pollution – a leading cause of premature mortality worldwide – in places where solid fuels such as wood, crop residues, and dung are used for cooking, notably south Asia and sub-Saharan Africa.[6]

The impacts of power disparities can operate across national borders, too, displacing environmental harm originating in high-income countries onto vulnerable communities in low-income countries. In a 1992 memorandum, Lawrence Summers, then chief economist at the World Bank, wrote that 'the economic logic of dumping a load of toxic waste in the lowest-wage country is impeccable.'[7] All too often environmental practice follows this script, as millions of tons of toxic waste are shipped each year from advanced industrialized countries of the global North to Africa, Asia, and Latin America (Kellenberg 2015).

Inequality and the magnitude of environmental degradation

The impact of inequality on the total magnitude of environmental degradation has received somewhat less attention from researchers, in part because quantitative analysis has been hindered by a paucity of the necessary data. Year-to-year variations in inequality and environmental quality are likely to be small, and the environmental impacts of inequality are likely to operate on a multi-year time frame, features that render time-series analysis problematic. Cross-sectional analysis, meanwhile, is complicated by issues of choosing the appropriate spatial scale and by the need to control for a large number of potentially confounding variables. Notwithstanding these difficulties, the topic has received growing attention.

Before turning to the evidence, it is useful to consider why one might expect greater inequality to lead to more environmental harm. One reason has already been discussed: the concentration of environmental costs at the lower end of the wealth-and-power spectrum. The wider the extent of inequality, the less weight these costs receive both in the economic scales

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[6] See, for example, Okello *et al*. 2018. Austin and Meija (2017) find that the ratio of female to male premature deaths from indoor air pollution is inversely related to indicators of women's status.

[7] 'Let Them Eat Pollution,' *The Economist,* 8 February 1992. The economic logic invoked here is the neoclassical efficiency criterion as implemented in cost-benefit analysis. 'The measurement of the costs of health-impairing pollution depends on the forgone earnings from increased morbidity and mortality,' Summers argued. 'From this point of view a given amount of health-impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages.' See discussion below.

of cost-benefit analysis and in the political calculations of public-sector and private-sector decision makers.

The second reason is the converse of the first: the benefits from environmentally degrading activities tend to be concentrated at the upper end. The externalization of environmental costs leads to lower production costs, generating benefits in the form of higher profits for the firm's shareholders, higher compensation for its executives, lower prices to consumers of its products, or a combination of these.[8] In general, shareholders and executives occupy relatively high rungs on the wealth-and-power spectrum. Insofar as the benefits of cost externalization are passed along to consumers, they accrue in proportion to consumption, benefiting those with the most purchasing power. The wider the extent of inequality, the more weight these benefits receive in cost-benefit analysis and in the eyes of decision makers.

Of course, many affluent individuals prefer to live in a clean and safe environment. To a considerable extent, however, environmental quality is an impure public good in that while not entirely private, it also is not equally available (or unavailable) to everyone. Relatively wealthy and powerful people can afford to live in neighborhoods with cleaner air. They also can afford bottled water, air conditioners, and air purifiers. In the event of illness caused by pollution exposure, they can obtain better medical care. At the same time, they can more effectively prevent the siting of environmental hazards in their own neighborhoods. To be sure, they may not escape the consequences of environmental degradation altogether, but in their private calculations they balance a relatively small share of the costs against a relatively large share of the benefits.

In sum, one can expect greater inequality to lead to more environmental degradation by making it politically easier, as well as more 'efficient' by the canons of neoclassical economics, for those who benefit from it to impose the costs upon others.

Cross-national data on several dimensions of environmental quality became available to researchers in the early 1990s. One of the first questions that economists used these data to address was the relationship between environmental degradation and per capita income. In a well-known study, Grossman and Krueger (1995) analyzed several indicators of air and water quality and found that pollution tended to rise with per capita incomes up to a turning point, in the neighborhood of $5,000, after which environmental quality improves. The result was an inverted U-shaped relationship between per capita income and environmental degradation that resembles the curve postulated by Kuznets (1955) on the relationship between per capita income and income inequality. The new relationship became known as the 'environmental Kuznets curve' (EKC).

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[8] The partitioning of the internal benefits of environmental cost externalization (and, conversely, the costs of pollution taxes and regulatory compliance) across shareholders, executives, and consumers has received remarkably little attention from empirical researchers. Theoretical models often assume full pass-through to consumers, an assumption that seems incongruent with widespread corporate opposition to environmental policies.

The EKC appeared to offer an escape from the bleak idea that economic growth is incompatible with environmental protection. Maybe there are no environmental limits to growth, after all. Maybe humans are not, as a prominent environmental historian once declared, a 'cancerous' species that 'endangers the larger whole' (Nash 2001, p. 386). A spirited debate ensued between some who saw economic growth as the solution to environmental ills and others who instead saw it as the root disease.

Few noticed that Grossman and Krueger also reported that, in a number of cases, further growth in per capita income led to a second turning point after which pollution again began to rise – a result that would seem to bring little comfort to the growth-as-cure school of thought. Moreover, Grossman and Krueger cautioned that 'there is nothing at all inevitable about the relationships that have been observed in the past' (p. 372).

In a follow-up paper, Grossman and Krueger (1996) observed that policy responses driven by 'vigilance and advocacy' on the part of the public are likely to be the main explanation for improvements in environmental quality. This suggests that the similarity between the EKC and the original Kuznets curve may not be mere coincidence. If, as Kuznets suggested, there is a turning point after which inequality falls as per capita income rises, then parallel improvements in environmental quality may be driven not by per capita income itself but instead by less inequality.

When proxies for inequality in the distribution of wealth and power were added as possible determinants of cross-country variations in environmental quality, the results supported the hypothesis that they are inversely related. Indeed, controlling for proxy variables such as political rights and civil liberties in many cases caused the EKC relationship between pollution and per capita income to weaken or disappear.[9]

Today more cross-national evidence has become available. Researchers have found that greater inequality is associated with worse environmental performance not only in terms of air and water pollution, but also in other respects. The proportion of plants and animals threatened with extirpation or extinction is higher in countries with more unequal income distributions (Mikkelson *et al.* 2007, Holland *et al.* 2010). Rates of deforestation are higher in countries with higher levels corruption, a variable that can be interpreted as both a cause and a consequence of inequality (Koyunco and Yilmaz 2009). In upper-income countries, private patents on environmental innovations and public expenditure on environmental research and development both are lower in countries with wider income inequality (Vona and Patriarca 2011).

The evidence for adverse environmental effects of inequality generally is strongest for variables that have immediate impacts on human health, including air and water pollution, as one might expect (Cushing *et al*. 2015). For environmental impacts that are widely dispersed across time and space, the evidence is more mixed. Recent studies nevertheless have reported evidence of

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[9] See Torras and Boyce (1998), Harbaugh *et al*. (2002), Neumayer (2002), and Farzin and Bond (2006).

an inverse relationship between inequality and carbon dioxide emissions (Knight *et al.* 2017, McGee and Greiner 2018). Part of the explanation may be that fossil fuel combustion also generates conventional air pollutants, such as sulfur dioxide and nitrogen oxides, that trigger public demands for emission reductions.

Inter-state studies have found evidence that inequality adversely effects environmental outcomes within the U.S. States with more unequal distributions of power tend to have weaker environmental policies, leading to greater environmental stress and worse public health outcomes (Boyce *et al.* 1999). Inter-state differences in inequality also have been found to be correlated with carbon dioxide emissions (Jorgenson *et al*. 2017).

Taking metropolitan areas as the unit of observation, Morello-Frosch and Jesdale (2006) found that in the U.S. cities with more residential segregation by race and ethnicity tend to have higher cancer risks from air pollution for all population groups. Similarly, Ash *et al*. (2013) found that in metropolitan areas that rank highest in terms of racial and ethnic disparities in industrial air pollution exposure, average exposure levels are higher for Anglo whites, too, implying that that environmental justice can be 'good for white folks.'

The implication of all these studies is that protecting the environment and reducing inequality can and should be complementary goals. With lower levels of inequality, the public is better able protect the air, water, and natural resources on which human well-being depends.

Normative Issues

Policy prescriptions invariably rest on normative criteria, the explicit or implicit ethical principles by which we assess alternative courses of action and states of the world as better or worse. Neoclassical economics invokes one overriding criterion for this purpose – efficiency – and neoclassical environmental economists have invested a great deal of time and effort in trying to operationalize this for policy making purposes. Political economists often invoke other criteria, including safety, sustainability, and justice. How best to operationalize these, and how to combine them, are key issues yet to be fully resolved.

Efficiency

The term 'efficiency,' as deployed in neoclassical economics, refers to something more than cost-effectiveness. In everyday speech, these notions are often used as synonyms. When we speak, for example, of the most efficient way to the most efficient way to travel from point A to point B, we are really talking about cost-effectiveness, the lowest-cost means to achieve this end. But when neoclassical economists speak of efficiency, they are not only referring to decisions about the means, but also how to choose the ends themselves, asking for example whether it is desirable to travel from A to B at all.

Cost effectiveness can be applied to the pursuit of ends chosen on the basis of any of the criteria mentioned above. For example, policy makers may use a safety criterion to decide upon air quality standards, and then try to choose the most cost-effective ways of attaining the safety objective. In invoking efficiency to choose the standards themselves, neoclassical economics goes considerably further, requiring the policy maker to put a monetary value on protecting public health and saving human lives, and to weigh this against the costs of doing so in order to decide on the 'efficient' level of clean air.

In theory, neoclassical efficiency is based on a seemingly non-controversial idea: 'Pareto optimality,' the proposition that an optimal state of the world is one where no individual can be made better off without making someone else worse off.[10] Because it is silent when it comes to how the economic pie should be distributed, there are innumerable outcomes that could qualify as Pareto optimal. Even if saving the life of an impoverished child at the cost of one dollar to a millionaire, strict Pareto optimality offers no grounds for advocating it, because the millionaire would be made fractionally worse off. Efficiency in this sense of the term amounts to saying that twenty-dollar bills should not be left lying on the ground. As a basis for policy making it has little cutting power, since just about any policy, even one that makes very many people very much better off, will make someone at least somewhat worse off.

To escape from this prescriptive cul-de-sac and arrive at a more practical basis for its policy prescriptions, neoclassical economics replaces strict Pareto optimality with a more flexible criterion, that of a 'potential Pareto improvement.' One state of the world can now be judged preferable to another one if those who are made better off could, in theory, compensate those who are made worse off, and still come out ahead. Whether compensation is really paid is shrugged off as a distributional issue that is extraneous to making a policy prescription based on efficiency. By this sleight of hand, the policy goal becomes simply the biggest economic pie, its size being measured by its monetary value, regardless of how the pie is sliced. In macroeconomics this translates into maximizing GDP. In microeconomics it translates into maximizing net benefits, calculated by the tools of cost-benefit analysis.

Economists have devised a number of quasi-ingenious methods to assign monetary values to things without a market price tag, from the value of a statistical life (meaning the value of avoiding a risk of premature death) to the value of endangered species, clean air, and climate stability. Mostly these methods rest on willingness to pay: how much would people in a given population be willing to pay to reduce their risk of premature death, save the whales, and so on. Just as in real markets, individual preferences count insofar as they are backed by ability of to pay. In markets for food, hunger generates effective demand only if it is backed by purchasing power. So, too, in the shadow markets of cost-benefit analysis, the value of a clean and safe environment rests not only on what people desire but also on what they can pay for it.[11]

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[10] Controversy can arise, however, when adherence to the Pareto criterion violates with other norms, such as liberty. See, for example, Sen (1987).

[11] It is sometimes claimed that in focusing only on the size of the economic pie, neoclassical efficiency is neutral regarding how pie is distributed. This is not strictly true. The prices used to measure the size of the pie reflect the distribution of purchasing power. If, for example, income were reallocated from rich to poor, demand for rice and

The result is encapsulated in the memorandum by World Bank chief economist Lawrence Summers, maintaining that toxic waste should be dumped in the country with the lowest wages. 'The arguments against all of these proposals for more pollution in LDCs [less developed countries],' Summers concluded, citing 'intrinsic rights to certain goods' and 'moral reasons' as examples of such arguments, 'could be turned around and used more or less effectively against every Bank proposal for liberalization.'[12] Or, one might add, against any policy prescription based exclusively on the normative criterion of neoclassical efficiency.

Safety

Existing environmental laws and policies often rest on a quite different normative foundation: safety. In the United States, for example, the Clean Air Act directs the Environmental Protection Agency to establish air quality standards for 'the protection of public health and welfare' while 'allowing an adequate margin of safety' – not to decide on standards by weighing the benefits of protecting public health against its costs.[13] In such a world, economists play a more modest role. They can recommend how to pursue the objective most cost-effectively, but it is not their job to decide on the objective itself.

Safety is generally a matter of degree, so there is often some arbitrariness in deciding what qualifies as 'safe.' In practice, environmental policy makers often follow a rule of thumb, such as defining the acceptable risk from pollution as adverse health impacts on 1 in 10,000 people, or 1 in 100,000, in a given year.[14] Similarly, in international climate policy, the Paris Agreement's goal 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 is based on scientific assessments as to what is safe, rather than judgments by neoclassical economists as to what is efficient.[15]

The ethical underpinning for the safety criterion is the principle that everyone has the right to live in a clean and safe environment. In many countries, this right is enshrined in the most fundamental of legal documents, the national constitution. The post-apartheid Constitution of the Republic of South Africa mandates, for example, that 'every person shall have the right to

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beans would go up, and demand for champagne and caviar would go down, changing their prices and thereby altering the 'efficient' composition of output.

[12] 'Let Them Eat Pollution,' *The Economist,* 8 February 1992.

[13] 42 U.S. Code § 7409 - National primary and secondary ambient air quality standards, section (b)(1).

[14] For discussion, see Kutlar Joss *et al.* (2017); Hunter and Fewtrell (2001).

[15] For discussion, see Schleussner *et al.* (2016). For a comparison of very different carbon price recommendations based on the criteria of safety and neoclassical efficiency, see Chapter [xx] in this volume. [Note to editors: Insert reference to my chapter on carbon pricing.]

an environment that is not detrimental to his or her health or well-being.'[16] Insofar as rights are held equally by all, the safety criterion provides a far more egalitarian basis for environmental policy than willingness to pay.

The economics of implementing the safety criterion are relatively straightforward. All that is required is an assessment of the costs of alternative means of meeting the standard, as opposed to the calculation and comparison of the benefits and costs of a wide range of possibilities.

One conceptual issue that worth considering, however, is the difference between saying that each individual enjoys an equal right to risk mitigation and saying that each statistical life counts equally. In the latter case, the same level of risk to an individual – for example, from air pollution – would carry more weight in densely populated areas than in sparsely populated areas simply because more people are impacted in the former. In other words, paraphrasing Summers, by this logic a load of toxic waste should be dumped in the location with the lowest population density. To be sure, few would advocate siting a nuclear waste dump in proximity to a major population center. But from the perspective of individual rights, what is deemed safe should not vary depending on whether one lives in the city or the countryside.

Sustainability

The ethical underpinning for the sustainability criterion is intergenerational equity. Often this is translated into the goal of ensuring that the well-being of future generations is no less than that of the present generation. The Brundtland Commission in 1987 expressed idea this in turns of human needs: sustainable development 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development 1987, p. 8). Alternatively, sustainability is sometimes defined in terms of a non-decreasing stock of natural capital or of total natural and human-made capital (called 'strong' and 'weak' sustainability, respectively).

The sustainability criterion departs markedly from neoclassical efficiency, where the well-being of future generations is handled by discounting future costs and benefits to obtain their 'present values.' With a fairly modest discount rate of four percent, for example, a $100 million cost (in today's dollars) to be incurred 100 years from now is valued at only $2 million today. In other words, it would be inefficient for the present generation to spend more than $2 million in order to avoid this cost on behalf of future generations.

Private firms often use discounted cash flow analysis to make investment decisions, since money has 'time value' by virtue of its potential earning capacity. Individuals also exhibit 'time preference' in their decisions, valuing a dollar today more than the same dollar a year or more hence. Inequalities of wealth and power may increase the discount rates used in private

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[16] For other examples, see Popovic (1996).

decisions, further devaluing the well-being of future generations. Among the very poor, the imperatives of day-to-day survival may become so pressing as to overshadow concerns about tomorrow. Among the very rich, fear that popular discontent will one day dislodge them from their privileged positions may encourage a cut-and-run strategy for natural resource management, exemplified by the rapacious deforestation across much of Southeast Asia in the 1960s and 1970s under the rule of dictators like Marcos in the Philippines.[17]

Neoclassical cost-benefit analysis elevates discounting from a private calculus into an ethical principle for public policy decisions that will impact future generations. The effect of discount rates is to count their well-being for less – often stunningly less – than our own. One rationale proffered for this seemingly callous stance is the belief that human well-being is on an upward escalator that inexorably rises over time. Citing a forecast that global per capita income will grow from about $10,000 today to roughly $130,000 (in today's dollars) in the next two centuries, climate economist (and future Nobel laureate) William Nordhaus argued, for example, that 'while there are plausible reasons to act quickly on climate change, the need to redistribute to a wealthy future does not seem to be one of them' (Nordhaus 2008). Yet one might think that climate change itself would be enough to cast a rather large shadow over the comforting assumption of a dramatically wealthier future for humankind.

In effect, the sustainability criterion imposes a constraint on decision makers today. Efforts to translate this into an operational criterion pose several questions, however. What, precisely, is to be sustained? How should it be measured? Is human-made capital, for example, a good substitute for natural capital? Even if we adopt a stringent constraint such as maintaining the stock of natural capital, how do we combine diverse resources like clean air, clean water, minerals, and biodiversity into one measure? Instead of trying to come up with a single metric, should we measure sustainability as a multi-variable vector?[18] Why should we take today's levels as a benchmark? If human well-being, or the stock of capital, grows or declines over time, does the threshold for sustainability rise or fall with them? These practical issues may be no more (or less) insuperable than the monetary valuations required to operationalize the neoclassical efficiency criterion, but to date they have received relatively little attention.

Justice

Justice is often regarded as a central normative goal in the political economy of the environment. The distribution of environmental costs and benefits is important not only because of what it tells us about how the world works, but also because justice is a compelling end in itself.

Whereas sustainability addresses intergenerational equity, justice addresses intragenerational equity. While neoclassical efficiency focuses on the size of the pie, justice focuses on how it is

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[17] See Broad and Cavanagh (1993) and Boyce (1993).

[18] The vector approach to sustainability assessment is suggested by Pearce *et al.* (1990).

sliced. Whereas the safety criterion aims to protect public health, justice seeks to ensure that environmental health – whatever its level – is distributed fairly across the population.

Environmental justice most often refers to equity across subgroups of the population defined on the basis of race, ethnicity, income, gender, or other attributes. As discussed above, a large body of evidence has found systematic environmental disparities to exist, with disproportionate costs imposed on certain racial and ethnic groups, on low-income communities, and in some cases on women.

An alternative approach is to rank the whole population by the environmental attribute in question – exposure to air pollution, for example – and compute a distributional measure such as the Gini coefficient to assess the extent of disparity. This vertical measure of inequality has been applied to environmental quality much less often than horizontal (inter-group) measures, but it, too, may be regarded as salient to environmental justice.[19] Rather than relying on a single measure of justice, an alternative approach could be treat it as a vector of variables encompassing both horizontal and vertical equity.[20]

As a normative goal, justice requires the reduction or elimination of environmental disparities. In principle, this could be achieved either by reducing pollution and resource depletion in overburdened communities or by increasing them in less burdened communities. The latter possibility has led some critics to accuse environmental justice advocates of 'Nimbyism,' the 'not-in-my-back-yard' ethic that contributed to the environmental disparities in the first place. In response, proponents have countered that their ultimate goal is 'Not in anybody's back yard,' a formulation close to the safety criterion.

In implementing the justice criterion, two additional issues warrant mention. The first is how to aggregate across diverse dimensions of environmental quality. There is an important difference, for example, between a situation where one type of pollution is concentrated in one community and another type in another community, versus a scenario in which both are concentrated in the same community. The theoretical and empirical literature on environmental justice suggests that the latter situation is quite common, but the extent to which different environmental impacts offset each other across communities, as opposed to being additional or perhaps even multiplicative, deserves more attention.

The second issue involves spatial scale. Two adjacent locations each many have an equitable distributions of environmental costs within them, but a highly inequitable distribution between them. This means that if combined into a single spatial unit – as we move, for example, from a subnational to the national scale – the measured extent of environmental inequality may

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[19] For discussion and comparisons of vertical and horizontal measures, see Boyce *et al.* (2016).

[20] In this approach, environmental justice could be defined in terms of an $n+1$ dimensional vector, where n = the number of horizontal differentiations on the basis of race, ethnicity, gender, region, or other attributes, with one measure of vertical inequality added.

change rather dramatically. This is particularly relevant to environmental justice on a global scale. If highly polluting production processes are shifted offshore from North America to Asia, or from western Europe to eastern Europe, for example, this could diminish environmental disparities within countries while exacerbating them internationally.[21]

Multiple criteria and incomplete orderings

The four criteria discussed above – efficiency, safety, sustainability, and justice – offer distinct normative bases for evaluating outcomes and prescribing policies. In some cases they will lead to divergent conclusions, but in others they may lead to the same results.

In fact, there may be a substantial degree of compatibility among safety, sustainability, and justice, the alternatives to neoclassical efficiency that are favored by political economists.[22] Higher levels of environmental degradation that are linked to wider disparities of wealth and power are likely to contradict all three normative goals. And at least in cases where these outcomes reflect disparities in political power, rather than simply disparities in purchasing power, they may contradict neoclassical efficiency, too.[23]

Multiple-criteria decision analysis offers an alternative to relying solely on one criterion or another. When rankings across alternative outcomes coincide across all criteria, decision making is relatively easy. In cases where they diverge, the result is an incomplete ordering.[24] Rather than sweeping these different conclusions under the rug by relying on one criterion alone, or by collapsing multiple criteria into a single metric, the best course of action may be to acknowledge this reality and debate the best course of action accordingly.

Concluding Remarks

The political economy of the environment aims to deepen our understanding of the interplay among the economy, the environment, and human well-being. In contrast to neoclassical environmental economics, it pays attention not only to the net magnitude of costs and benefits but also to their distribution.

In the realm of positive analysis – descriptions of how the world works – this means exploring the multiple ways in which the distribution of wealth and power affects environmental

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[21] Studies of pollution offshoring have reached mixed conclusions; see, for example, Li and Zhou (2017), Cherniwchan *et al.* (2017), and Brunel (2017).

[22] For further discussion of the mutually reinforcing links between sustainability and justice, see Laurent (2019).

[23] For discussion of the relationship between environmental injustice and efficiency, see Glasgow (2005). For a discussion of tradeoffs and compatibilities across criteria applied to urban development, see Kremer *et al.* (2019).

[24] See Sen (2004) for a discussion of alternative approaches to incompleteness.

outcomes. The political economy of the environment posits that our relationships with nature are tied intimately to our relationships with each other.

Research has demonstrated that the costs of environmental degradation do not fall randomly across the population. 'Negative externalities,' as these are called in neoclassical economics, are not impersonal side effects of economic activities. Instead, their dispersion maps that of purchasing power and political power. More research is needed to better understand the dynamics behind this and the reasons for variations in the patterns and extent of disparities across time and space.

Research also has supported the hypothesis that inequalities affect the overall magnitude of environmental degradation, as well as the distribution of the resulting costs and benefits. This would imply that the goals of protecting the environment and working for a more equitable distribution of wealth and power are complementary. Again, more research is needed to better understand the nature and strength of these effects across the multiple dimensions of environmental quality.

In the realm of normative analysis – prescriptions for how the world should work – political economists advocate a wider range of criteria for decision making decisions than relying solely on neoclassical efficiency, defined as the maximization of net benefits regardless of their distribution. This does not mean that political economists regard the overall magnitude of net benefits as unimportant, but simply that they do not regard this as the only gauge by which outcomes should be measured and compared. Nor does it mean that political economists are unwilling to consider cost effectiveness in deciding on the means to pursue environmental ends, however the ends are chosen.

Safety, sustainability, and justice are the alternative criteria that political economists invoke for evaluating environmental outcomes and recommending policies. More research is needed to operationalize these fully for the policy-making purposes. And more research is needed to explore how multiple criteria can be brought to bear on decision-making processes.

In sum, the political economy of the environment deals with some of the most urgent questions of our time, yet as a field of inquiry and research it is still at a fairly early stage of development. There is ample room for important work to be done.

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