

# Environmental and Natural Resource Economics and Systemic Racism

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## Introduction

Systemic racism is racial discrimination that extends beyond individual beliefs and interpersonal interactions to pervade institutions, policies, and unwritten norms. There is extensive evidence of the depth and breadth of systemic racism, both historically and in present-day society.<sup>1</sup> The human experience of the environment and environmental policy is not independent of the world's racial inequities. For instance, the US environmental justice movement has shown that environmental hazards are disproportionately borne by the poor and people of color (e.g., Bullard 1983). This article examines how the work of environmental and natural resource economics (ENRE) itself may unintentionally uphold, rather than work against, status quo racial inequity. By evaluating common practices in ENRE in relation to justice and racial equity, researchers in the field can be empowered to refine existing methods and develop new tools to address systemic racism.

Our work complements, but differs from, the expanding economics literature on environmental justice (Banzhaf, Ma, and Timmins 2019), which studies unequal exposure to pollution and access to environmental amenities. We explore the relationship between race and

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<sup>1</sup>Racial inequity stems from many factors, including historical enslavement of (primarily Black) people of color (Logan 2022) and removal of Indigenous people from their land (Farrell et al. 2021). It is also the result of ongoing racial discrimination in domains from health care (Bajaj and Stanford 2021) and policing (Boyd 2018) to labor, credit, and other markets (Lang and Kahn-Lang Spitzer 2020; Small and Pager 2020). Indeed, stratification economics (Chelwa, Hamilton, and Stewart 2022)—an influential model of inter-group disparities—holds that “material benefits that redound to dominant groups” induce efforts to retain advantages through discriminatory practices (Darity 2005, 144). As a result, racial discrimination is unlikely to fade without conscious interventions.

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the tools, models, assumptions, and recommendations of ENRE analysis itself. Our goal is not to quantify the role of ENRE in producing racist outcomes. Rather, we highlight how race enters into ENRE's methods and policy recommendations, perhaps without any scholar's conscious intention. Our analysis reveals opportunities for innovations in both analysis and policy.

We begin by laying out foundational background and definitions. We contextualize this discussion within the history of racial inequity in the United States, although we also describe how these issues apply internationally. We then discuss three areas in which the field's approaches, when applied without consideration of systemic racism, can inadvertently maintain or exacerbate existing racial inequities. The first area discusses methods for assigning a monetary valuation to environmental benefits and also considers the problem of aggregating costs and benefits across the whole society, without enough attention to the different effects on marginalized groups. The second topic is policy modeling and analysis. The third addresses management of the commons. The article concludes by discussing how ENRE research could better address issues of structural racial inequity.

Four overlapping themes weave through this article. First, economics, including ENRE, continues to prioritize economic efficiency above distributional welfare. Second, economists study outcomes more often than process and thus neglect questions of procedural justice. Third, environmental and natural resource economists often overlook historical and institutional context—notably, racist systems that have produced tremendous inequality in wealth, income, property ownership, power, experienced environmental quality, and health care. Fourth, ENRE tends to study a narrow set of policies, focusing on those that are readily analyzed with modern empirical tools and those perceived as directly related to the environment. These four themes do not span the whole of the field's challenges with regard to racial equity; however, they showcase some ways ENRE methods and mindsets can inadvertently work to uphold systemic racism, and thus they demonstrate a need for deliberate attention to the racial implications of ENRE scholarship.

## Foundations

Historically, ENRE, following the norms of neoclassical economics more broadly, has not widely acknowledged the role of systemic racism in determining the distribution of experienced environmental quality, nor has it given significant attention to policies that combat inequities in access to natural resources and environmental quality. These oversights may be influenced by the lack of diverse perspectives in the field. Environmental and natural resource economists are not racially diverse, perhaps in part because economics overall is experienced as hostile and presenting barriers to scholars of color (Bayer, Hoover, and Washington 2020). Though comprehensive data are difficult to find, Kuminoff et al. (2022) find that registrants at the 2021 Association of Environmental and Resource Economists (AERE) conference self-reported as 62 percent White, 31 percent Asian, and only 2 percent Black. An analysis of a 2012 survey of members of AERE shows that 87 percent of survey respondents identified as White (Haab and Whitehead 2017). Hilsenroth et al. (2021) find that 78 percent of assistant, 87 percent of associate, and 90 percent of full professors in agricultural and applied economics departments identified as White. Economists also earn relatively high incomes;

the mean reported salary for new economics PhDs was \$120,373 in 2021 (Jebaraj, Sorto, and Kali 2021). Furthermore, relative to other PhD fields, economists tend to be extremely socio-economically advantaged and generally unrepresentative (Stansbury and Schultz 2023).

Systemic racism is relevant to ENRE analysis because it affects many settings and markets that shape experienced environmental quality and access to natural resources. Labor market discrimination (Darity and Mason 1998; Bertrand and Mullainathan 2004) limits employment opportunities and wages for people of color. Credit market discrimination in housing (Munnell et al. 1996) and in the greater financial sector (Blanchflower, Levine, and Zimmerman 2003) restricts wealth accumulation among people of color and thus their ability to pay for investments in environmental quality and pollution avoidance (such as an air filter or even a house in a less polluted area). Meanwhile, discriminatory zoning policy (Hinds and Ordway 1986; Whittemore 2017) and behavior in the real estate market (Christensen, Sarmiento-Barbieri, and Timmins 2020) directly restrict the ability of people of color to live in neighborhoods with clean environments. Discrimination may create other “frictions”—flaws in the operation of markets—that similarly limit choice relating to the environment.

Racial disparities in wealth, land, and exposure to environmental hazards reflect this ongoing systemic racism. The 2016 US Survey of Consumer Finances shows a median net worth of \$17,600 for Black households as compared with \$171,000 for White households (Dettling et al. 2017). Indigenous tribal land area in the United States has shrunk by 94 percent from its historical peak, and current tribal land experiences above-average levels of extreme heat and drought (Farrell et al. 2021). People of color are disproportionately likely to be exposed to air pollution (Colmer et al. 2020), live near toxic waste sites (Currie 2011) and oil and gas infrastructure (Kroepsch et al. 2019), experience extreme urban heat (Hsu et al. 2021), and bear larger damages from climate change (Barbier and Hochard 2018). These inequities are not unique to the United States (e.g., Harper, Steger, and Filčák 2009; Viel et al. 2011). Moreover, globally, these issues may arise not only on dimensions of race and ethnicity but also on caste, religion, and social status, among others (Newell 2005; Laurent 2011). In short, there is growing evidence of the negative impacts of systemic racism on environmental conditions experienced by communities of color. However, documentation of the prevalence and magnitude of the problem in ENRE is far from complete. Crucially, what remains unclear is the extent to which ENRE methods and policy recommendations affect, and are affected by, these challenges.

The evidence that does exist points to inequities in the distribution of both environmental outcomes and meaningful opportunities to seek better environmental conditions. However, an exclusive focus on equitable outcomes (distributive justice) disregards procedural justice. Procedural justice requires “fair, participatory, and inclusive structures and processes of environmental decision making” (Bell 2014, 1). It is a standard element of environmental justice definitions.<sup>2</sup> Just processes give affected communities a voice, treat them with respect and impartiality, and are transparent (LaGratta 2017). Procedural justice has intrinsic value through satisfaction of moral beliefs about recognition, agency, and respect. It also has practical value, because policies are likely to be more effective when they are influenced by the people best positioned to observe the environmental problems those policies target. Distributive and

<sup>2</sup>EPA states that environmental justice requires “equal access to the decision-making process to have a healthy environment in which to live, learn, and work” (US Environmental Protection Agency 2021).

procedural justice are complements: unequal starting points may create unequal outcomes regardless of a just process, and distributional fixes alone do not eradicate procedural neglect and disenfranchisement (Schlosberg 2004).

## **Welfare Economics and the Measurement of Values**

Environmental and resource economists use welfare economics—a set of tools that studies factors contributing to society’s overall well-being or utility—to determine the benefits and costs of environmental policies. The application of these tools allows economists to make normative statements about the desirability of policy outcomes. The underlying assumption is that people have individual preferences about which goods and services they want to consume, including environmental quality, and that we can come up with a social welfare value by aggregating those individual preferences. However, it is difficult to identify these preferences when goods and services—such as the enjoyment of fishing in a clean river—are not priced in markets.

Various methods have been developed to assign a value to these nonmarketed goods and to make overall social welfare estimates. However, these methods can perpetuate racial inequity in several ways. First, systemic racism can influence empirical estimates of the value of environmental services. Second, methods of aggregating environmental preferences across the population can produce policy advice that perpetuates inequities. Third, the ways in which we use values, and the types of values we privilege, may conflict with the value systems of many marginalized peoples.

### **Biases in Individual Value Measures**

Nonmarket valuation captures the values that society has for environmental quality and natural resources. It thus allows the public benefits of environmental improvements to be measured and weighed against the more easily observed costs of those environmental improvements, such as the expenses that must be incurred to restore a wetland, or the forgone value of alternative uses of land such as real estate developments. However, some valuation practices yield value estimates that disadvantage marginalized people.

Environmental economics has established that income is a major determinant of the two ways of measuring people’s values for environmental benefits: willingness to pay (WTP) and willingness to accept (WTA). WTP refers to the amount of money someone is willing to pay for an environmental benefit, such as clean air or water. WTA asks how much money someone would accept to give up an environmental benefit.

Wealth also likely influences demand for environmental goods. For example, wealth enables down payments and reduces the cost of credit (e.g., Fuster and Zafar 2021). This facilitates investments that can improve experienced environmental quality, such as moving to a less polluted area. Because wealth and income are correlated with race (see “Foundations”), value estimates are as well.

In the face of competing needs for money, a lower-income person is less likely to spend money on environmental benefits. In technical terms, the marginal rate of substitution between income and environmental quality likely decreases as income increases (e.g., Fankhauser, Tol, and Pearce 1997). Thus, income differentials ensure that estimates of WTP

for environmental goods (and WTA for “bads”) will be higher on average for White people than for people of color, even if their preferences are the same.<sup>3</sup> Although little is known about the relationship between WTP and wealth, racial wealth gaps could cause an even bigger issue. As noted in “Foundations,” in the United States, White households have 10 times the wealth of Black households. If, as is intuitive, WTP does vary with wealth, this vast disparity would yield substantial differences in WTP. This is likely to occur even if WTP varies by only a small amount with regard to wealth because racial wealth gaps are extremely large.

Even controlling for factors like income, estimates of WTP for environmental goods can vary by race (Whitehead 2000). This is because systemic racism affects measured preferences through more than just income and wealth.<sup>4</sup> Sociologists have found that minoritized people in the United States have preferences for recreation and nature opportunities that are suppressed by present and historical experiences of harassment, violence, and exclusion (Green et al. 2009; Davis 2019). Racism can affect the actual preferences of nonminoritized groups as well. Backstrom and Woodward (2023) show that racial aversion causes White anglers to avoid areas where they might encounter non-White people. This would affect travel cost estimation—a method of estimating the value of an environmental service by considering how much people willingly pay to travel there. The racist behavior of White fishermen, in which they avoid areas where they might encounter non-White people, results in a lower estimate of the values of recreation sites near communities of color. Policy informed by such values could discourage public investments in amenities for minority groups.

Another issue involves the choice between measuring WTP versus WTA when valuing environmental change. WTA should be used if people are considered entitled (albeit not necessarily legally) to the superior state of environmental quality; if not, WTP should be measured (Knetsch 2010).<sup>5</sup> However, WTP estimates have been favored by the profession over WTA since the NOAA Blue Ribbon Panel on Contingent Valuation (Arrow et al. 1993). Because WTP values are typically smaller than WTA values (Brown and Gregory 1999), using WTP underestimates the social cost of environmental quality loss in cases where WTA is appropriate. This promotes environmental injustice when environmental losses fall largely on marginalized communities. For example, the damages of the 2010 Deepwater Horizon oil spill and the 1989 Exxon Valdez oil spill fell disproportionately on minority communities: Vietnamese American fishers in the Gulf of Mexico (Lichtveld et al. 2016) and Native Americans in coastal Alaska (Carson et al. 2003), respectively. WTA would be the appropriate welfare measure for these incidents because oil spills take away environmental goods to which people had *de facto* rights (Knetsch 2010). However, WTP estimates were used to inform damage claims in both cases (Bishop et al. 2017). This foreclosed the possibility of full compensation for affected communities.

<sup>3</sup>Preferences certainly vary across people. We hold preferences constant in this thought experiment to illustrate that a discrepancy in measured value does not necessarily imply a difference in actual preferences.

<sup>4</sup>Scholars note that race is not a fixed, biologically rooted concept but rather has been constructed by societies to demarcate groups (Chelwa, Hamilton, and Stewart 2022). Therefore, the variation found by race should be interpreted not as an inherent difference but as encapsulating the history of racial exclusion (Spriggs 2020).

<sup>5</sup>It can be difficult to determine relevant property rights, especially when such determination could have winners and losers.

Biases may be embedded in traditional estimation techniques for environmental valuation because nonmarket valuation overlooks frictions caused by racial discrimination (see “Foundations”). For example, the travel cost method of valuing nature-based recreation amenities can produce lower value estimates for people of color than for White people even were they to have the same preferences, because it often uses estimates of vehicle operation costs to determine the value of an environmental amenity, which implicitly assumes that people have access to a car (Lupi, Phaneuf, and von Haefen 2020). However, people of color are less likely to own a vehicle (Gautier and Zenou 2010) because of historically lower incomes and systemic racism in labor, credit, insurance, and automobile markets. Because access to recreation sites is generally cheaper for people with a vehicle, this practice underestimates travel cost—and thereby underestimates the value of a recreation site—for people of color.

Racial bias in estimates of nonmarket values can also affect benefit transfer. This is a method that adapts value estimates from past studies for use in a different site. Measured WTP for environmental goods increases with income, so adjustments for income differences improve the accuracy of value estimates from benefit transfer. But those adjustments can be problematic. It is common to assume that the elasticity of WTP with respect to income (the percent change in WTP for environmental quality resulting from a 1 percent change in income) is constant, meaning that the change in a person’s value when their income changes is roughly the same for a high- or low-income person (Johnston et al. 2021). However, this elasticity is smaller for lower-income households (Barbier, Czajkowski, and Hanley 2017). When the benefit transfer process uses a WTP-income elasticity that is too high for low-income and disproportionately minority people, their WTP for environmental quality will be underestimated. Benefit transfer work could allow WTP to be a nonlinear function of income (Johnston et al. 2021)—that is, the calculation could take into account that WTP does not respond to income changes in a constant fashion. Or benefit transfer estimates could use factors that control for the distribution of both income and inequitable environmental quality exposure (Meya 2020). However, these are not common practices.

### Justice in Aggregating Individual Values

Aggregation can add another layer of racial bias. Aggregation refers to the total net benefit of a policy, across the whole population. The idea that a policy is desirable if its benefits outweigh its costs corresponds to the existence of a potential Pareto improvement. If a policy offers a potential Pareto improvement, that means that society as a whole gains enough benefits that the winners could compensate the losers—although there is no guarantee this transfer will happen. Benefit–cost analysis (BCA) has long informed public choices in the United States, especially since Executive Orders 12291 and 12866, which, respectively, required BCA for any significant new regulation and guided the analyses of regulatory impact. BCA has informed the design of policies ranging from the Clean Power Plan to the designation of protected areas. Within this context, environmental and natural resource economists play a key role in estimating environmental benefits and damages to inform public choices.

As discussed earlier, people with lower incomes have lower WTP for environmental quality for a given set of preferences. Income and wealth disparities can thus cause similar investments in environmental goods (or cleanup) to appear to generate smaller benefits for people of color. When these values are aggregated, this could lead to recommendations of less



investment in environmental quality for communities of color. For example, Kremer et al. (2011) estimate WTP for water protection in western Kenya and show that policy makers using these estimates would choose less protection than if they used values typically assumed by health planners working in the Global South. These low WTP estimates, and their implication that water should be less protected, are natural consequences of the colonialism that suppressed income and wealth of people of color in Kenya.

Some existing practices aim to counter the fact that WTP varies with income and wealth. For example, economists routinely put a dollar value on population-level changes in human death rates to evaluate the trade-offs of investing in various projects. This is called the value of statistical life (VSL). One way to estimate VSL is to consider workers' earnings. Obviously, evaluating the value of life as a function of earnings would devalue the lives of lower-income people. Therefore, EPA does not use estimates that vary by income.<sup>6</sup> However, most non-market valuation research does not address this equity concern.

Formally, a BCA that simply adds up all WTP values underweights the preferences of low-income people (Coplan 2017). Because income and race are correlated (see "Foundations"), BCA done this way will systematically underweight the preferences of people of color. Unless the winners compensate the losers, policy decisions made based on such BCA can exacerbate racial inequity; decisions about environmental regulations that have net benefits to society often have costs that accrue disproportionately to low-income groups. For example, low-income and minority populations are disproportionately harmed by coal-waste pollution from power plants that are permitted to operate because they pass a benefit–cost comparison based on total costs and benefits (Coplan 2017). Modern BCAs should build equity concerns into their analyses and can do so using strategies that have already been developed. For example, alternative BCA approaches can apply equity weighting to counteract the inequity embedded in the distribution of income and environmental damages (Adler 2016). Such practices are not, however, commonly used. For example, the EPA guidelines for BCAs do not recommend any such practices.<sup>7</sup>

### Anthropocentrism, Commensurability, and Consequentialism

Despite its limitations, the standardized procedures of BCA can help government decisions that affect the environment to be less vulnerable to the influence of powerful parties. Nonetheless, ENRE scholars should recognize how the concepts underlying BCA advantage the belief structures of dominant groups. In particular, neoclassical economists, including those in ENRE, generally take a consequentialist and anthropocentric view of welfare that makes sweeping implicit assumptions about commensurability—a view that is fundamentally at odds with the value systems of many marginalized cultures.

Anthropocentrism focuses on the well-being of humans, and the well-being of nonhumans matters only insofar as it affects humans (Johansson-Stenman 2018; Carlier and Treich 2020). In contrast, some cultures' value systems directly account for nonhuman well-being,

<sup>6</sup>On the other hand, use of a VSL that does not reflect people's personal WTP to reduce mortality risk—for instance, a person's choice of engaging in a risky job or other activity—can itself violate procedural justice by denying them individual agency in evaluating trade-offs.

<sup>7</sup>See <https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses> (A-7).

and some have nonconsequentialist values. For example, most Native American tribes seek harmony with a world consisting of intrinsically valued beings and nonbeings (Hammer 2002), and nonviolence to animals, earth, and self is a common value in some South Asian cultures (Chapple 1993). Elements of the natural world in some Indigenous cultures are treated more like kin so that it is immoral to focus on maximizing material benefits from them (Salmón 2000; Kimmerer 2020).

The monetization of benefits and costs also assumes a commensurability (in which everything is implicitly interchangeable) that conflicts with ideas of sacredness, intrinsic value, or kinship with the natural world. For example, the US government has not recognized the intrinsic value that the Standing Rock Sioux perceive in lands they consider sacred, leading to intense conflict regarding the Dakota Access Pipeline (LaPier 2016). Other tribes have refused to accept hundreds of millions of dollars from the US government in compensation for lands that were illegally seized by the United States from tribes because doing so would contradict the principle that land is to be held in common (Zerbe and Anderson 2012). Schlosberg (2004) relates this to justice in the form of recognition of communities' cultural identities.

Finally, some view the welfare economics approach—and particularly the philosophy of utilitarianism, which justifies adding up costs and benefits—that underlies neoclassical economics as excessively narrow and not a meaningful measure of well-being (Sen 1987). This is in part because they are based on a consequentialist framework, which makes choices based on outcomes and neglects the processes that yield those outcomes. This framework can conflict with other value systems, including those based on rights (Spash 1997; Aldred 2006), and more expansive, and commonly accepted, views of justice (Schlosberg 2004). Unjust decision-making processes limit representation of the interests of marginalized people, as in the case of the lands held sacred by the Standing Rock Sioux (Johnson 2019), and promote unjust outcomes. Further, many people inherently value procedural justice (Dolan et al. 2007) or agency (Sen 1987, 1999).

## Policy Analysis

ENRE has sizable influence on policy choice and design through economic modeling and rigorous quantitative analysis. However, that influence may not always promote racial equity.

### Neglecting Equity-Relevant Complexities

Traditional models of policy impacts often overlook discrimination, transaction costs (such as the costs of gathering information, hiring experts, relocating, etc.), information failures (in which one party may know more than another), and other factors that mediate the effects of policy on racial equity. Further, econometric analyses often use simplified representations of race and gender that do not account for discrimination in the world from which the data emerge (Emmons and Ricketts 2017) or the socially constructed nature of these variables (Spriggs 2020).

Although abstraction is necessary to build tractable models, systematically omitting features that disadvantage communities of color can produce overly sanguine assessments of policies, institutions, and arrangements, which can deepen these disadvantages. This means that ENRE



may champion interventions that will not accomplish the desired goals, fail to advise policy makers to compensate “losers” for harmful outcomes that models are not designed to see, or fail to prescribe an intervention that would address an environmental problem borne by groups that are invisible in scholars’ models.<sup>8</sup> We present several examples of problems caused by abstraction.

First, some economic models assume that people can choose freely to live with their preferred balance of cost and environmental quality. These simple models produce inaccurate results because of racial barriers in access to environmental quality. Housing in areas with better environmental quality is more expensive, as amenity and health benefits are capitalized into sale prices and rents (Bishop et al. 2020). Racial inequity in wealth and income (see “Foundations”), combined with discrimination in areas including housing and employment, makes it more difficult for racial minorities to live in areas with good environmental quality (Ladd 1998; Asiedu, Freeman, and Nti-Addae 2012). A link between hidden pollution and observable amenities can exacerbate this issue (Hausman and Stolper 2020). For instance, homebuyers may be aware of noise pollution from air traffic in a neighborhood near a small airport, but they may not know about the lead exposure they face from the airport. Because residential sorting correlates with race, if environmental improvements require moving away from similar households, this creates an additional cost for minority households (Banzhaf and Walsh 2013). Discrimination can operate through zoning decisions that increase exposure to polluting industries among people of color (Shertzer, Twinam, and Walsh 2016). It can also work through real estate marketing systems that steer minority households away from low-pollution locations (Christensen, Sarmiento-Barbieri, and Timmins 2020). Similarly, White residents may act to keep racial minorities out of high-amenity neighborhoods by influencing zoning (Trounstein 2020) and may make them feel unwelcome or threatened if they do move into a majority-White neighborhood (Bell 2019).

Second, many predictive economic analyses of pollution policies before they are implemented are inaccurate because they implicitly assume that polluters will actually comply with the rules (Gray and Shadbegian 2021). In fact, this assumption is prescribed in EPA’s guidelines for BCA (US Environmental Protection Agency 2010, 5–9). However, polluters regularly violate standards (Andarge and Lichtenberg 2020; Zou 2021). Some recent research finds that pollution standards are less effectively enforced in low-income and minority communities (Grainger and Schreiber 2019; Li, Konisky, and Ziogiannis 2019), although an earlier review (Konisky and Reenock 2015) reports mixed evidence. Similarly, contracts for resource rights may have fewer environmental protections in communities with more minority households (Vissing 2015).

Third, studies of the effects of environmental policies on neighborhoods can yield misleading predictions by neglecting ripple effects through markets and relocation. Environmental policies can trigger gentrification and dissolution of minority neighborhoods (Gould and Lewis 2016). The industrially polluted sites known as brownfields, for example, tend to be located in neighborhoods with concentrations of racial minorities, who are also disproportionately likely to rent homes. As brownfields are cleaned up, rising housing values may displace

<sup>8</sup>For example, models of “representative” agents erase differences in race, gender, and other dimensions of vulnerability.

households of color (Lee and Mohai 2012, Freudenberg, Pastor, and Israel 2011). The welfare effects are even complicated for home-owning members of a majority-minority community: although their homes increase in value, these gains may be offset by a loss of cultural critical mass and support networks if their erstwhile community is dispersed (Pettersen et al. 2006). Similar issues arise in managed retreat from flood-threatened areas, as policies to buy out households are structured to recommend retreat more often for low-income and minority communities (Siders 2019).

Last, economists often ignore realistic barriers to bargaining for rights to environmental quality, despite evidence that bargaining has racially inequitable outcomes in the absence of government regulation (e.g., Vissing 2015). Coase (1960) posits that private parties can strike efficient arrangements regarding environmental harm without government intervention—if there are no transaction costs. Policies like EPA’s “33/50” program that promote voluntary pollution reduction rest on this idea, and the Toxic Release Inventory is supposed to empower people to negotiate with polluters or move to cleaner communities (Sam, Khanna, and Innes 2009). But, as Coase himself emphasized, transaction costs are often large (McCloskey 1998). In the context of bargaining for environmental quality, it costs time, money, and political capital to obtain necessary information and fight siting proposals. Because of discrimination and wealth inequality, these barriers are harder to overcome for people of color. Thus, ignoring transaction costs promotes environmental policies that perpetuate racial inequity in residential sorting and in the process of bargaining over environmental decisions.

ENRE scholarship incorporating these complexities exists, especially in the growing environmental justice literature, but the findings of this literature and analogous studies outside economics are still not widely incorporated into other studies. For instance, some ENRE scholars have studied impacts of and solutions to environmental gentrification (Banzhaf and McCormick 2012; Banzhaf, Ma, and Timmins 2019). However, other papers estimating the benefits of urban environmental improvements mention these concerns only in passing, if at all.

### Limited Policy Consideration Sets

Which policies we choose to study also affects racial equity. Eliminating racial disparities throughout society will require policies of broad scope and ambitious scale. In comparison, the set of policies studied by environmental and natural resource economists is narrow and anchored to the status quo with regard to race. We present three examples of this narrowness and then discuss potential contributing factors.

First, there is a need for policy and investment with regard to water and sanitation infrastructure in the United States. At least two million Americans lived without access to safe drinking water and sanitation between 2010 and 2014 (Dig Deep and US Water Alliance 2019). Water infrastructure inadequacy is a problem in urban areas, where climate change–induced extreme weather events overwhelm aging combined sewer systems (Aguilar 2021; Barnard, Gold, and Hu 2021), and in rural areas, where poverty and remoteness can force households to live with raw sewage flowing on their property (Flowers 2020). Black and Hispanic households are twice as likely as White households, and Native American households 19 times more likely, to lack indoor plumbing (Dig Deep and US Water Alliance 2019). Study of these topics in ENRE, however, has been limited (however, examples are Cutler and Miller 2005; Watson 2006).

Second, land taken from Indigenous communities could be returned to them. For example, the creation of the National Park System was made possible by the removal of Indigenous people from lands designated as national parks through physical force or treaties signed under duress (Treuer 2021). One way to repair this historical injustice would be to return ownership and administration of the national parks to Indigenous tribes (Treuer 2021). Acknowledgment and restoration of tribal control would counter historic injustice against Indigenous people and would function as environmental policy by affecting conservation activity. However, environmental and natural resource economists have not studied land restitution as policy.

Third, reparations for Black Americans as redress for enslavement and discrimination could diminish the economic divide between Black and White Americans by closing the tremendous racial wealth gap (Darity and Mullen 2020; Darity, Mullen, and Slaughter 2022). Wealth inequality is a primary cause of environmental inequality (e.g., Banzhaf and Walsh 2008). Reparations for Black Americans would increase wealth for Black Americans, giving them more choice in where to live and greater power to bargain and claim rights. This, in turn, would likely reduce disproportionate exposure to pollution among Black communities. Other scholars have proposed reparations for climate change–related injustices (Perry 2020); ENRE scholars could make contributions to this type of policy analysis but largely have not.

These examples are symptomatic of systemic limitations in ENRE and economics in general. First, the continued primacy of efficiency in economics discourages research on policies that focus on equity. Second, ENRE’s marginalization of procedural justice sidelines work on policies that target decision-making processes, such as zoning and permitting (Banzhaf, Ma, and Timmins 2019) or settlement of court cases for corporate environmental wrongdoing (Campa and Muehlenbachs 2021). Third, the homogeneity of ENRE scholars (see “Foundations”) also likely narrows ENRE policy analysis, because lived experiences inform scholars’ research. Finally, disciplinary norms related to research methodology shape what we study. Empirical analysis has been increasingly central to economics research over the past six decades (Hamermesh 2013) through the “credibility revolution” (Angrist and Pischke 2010). But prizing clean causal estimation narrows the policy set considered because, among other reasons, the fact that many policies that could reduce racial inequities have not yet been implemented means that they cannot be studied with these methods.

## Managing the Commons

The “Tragedy of the Commons” (Gordon 1954; Hardin 1968) is deeply embedded in ENRE (Frischmann, Marciano, and Ramello 2019). In this model, a failure of property rights causes environmental problems, particularly the overuse of resources in an open-access setting (where no one can be excluded) by people who act purely in their own individual self-interest. This model informs the economic discourse on open-access resources (e.g., Leibbrandt and Lynham 2018) and climate change policy (e.g., Barrett 2020), among other arenas.

Although the open-access model predicting overexploitation fits aspects of some environmental problems, such as highly migratory fisheries, it is not perfectly applicable to other problems studied by ENRE scholars. In some cases, alternative models of governance and of property ownership, including those held in community, better describe reality, and some newer literature has acknowledged this (e.g., Ferraro and Agrawal 2021). However, ENRE

policy recommendations often revolve around establishing private, individual, and enforceable property rights. Implementation of those recommendations sometimes ignores institutional and contextual complexities in ways that lead to predictably and systematically racially unequal outcomes.<sup>9</sup> The unintended incentives generated by externally imposed property rights and the inequitable distribution of benefits that result from such solutions rarely get much attention, and the institutions and voices of Indigenous communities of color are undervalued.

Scholars sometimes mischaracterize traditional modes of governance as failures because of the absence of private property rights, and they prescribe property rights–based solutions to reduce overuse of resources. This failure of vision could occur because, as Ostrom notes, the tragedy of the commons model does not allow for realistic forms of collective or self-governance because it assumes away important aspects of behavior (2008). In contrast, Ostrom (e.g., 1990) and others (e.g., Agrawal and Gibson 1999; Dietz, Ostrom, and Stern 2003) have shown that local institutions and community governance can promote environmental quality and resource conservation given certain conditions, and this is reinforced by examples of successful management of the commons by traditional systems (e.g., Feeny et al. 1990; Brinkley 2020).<sup>10</sup>

Overuse of property rights solutions is not a race-neutral scholarly choice, because, in the modern day, many traditionally or commonly managed resources are held by Indigenous communities of color, especially in low-income countries (Wily 2011). Nor is it the case that otherwise sound ENRE ideas have been poorly implemented. ENRE scholars note that, to implement market-based solutions, property rights must be formalized (Grainger and Costello 2014) and be made secure and enforceable (Alix-Garcia and Wolff 2014). However, as stratification economics notes, economics has often promulgated the use of markets in policy without recognizing how, because of economic, political, and social power, markets can intensify inequality (Chelwa, Hamilton, and Stewart 2022).<sup>11</sup> Wily (2011) argues that African land laws have failed to see traditional rights as real property rights and thus have failed to protect them as new markets have been introduced. As a result, to participate in conservation markets such as REDD (reduced emissions from deforestation and forest degradation) or trophy hunting markets, property right formalization has taken away or dramatically curtailed rights of communities that had previously commonly managed a resource (Dooley et al. 2008; Griffiths and Martone 2009; Yasuda 2012; Ituarte-Lima, McDermott, and Mulyani 2014).

The formalization of property rights to allow participation in markets frequently happens through processes that are not inclusive and that deny Indigenous communities of color agency and procedural justice. For example, early REDD projects ignored concerns raised by Indigenous peoples, nongovernmental organizations, and social development specialists

<sup>9</sup>In addition, scholars narrowly focused on property rights may ignore other causes of resource overuse, especially those related to history, context, and political power. For example, Aklin and Mildenberger (2020) argue that problems like climate change are better understood as political problems in which powerful players impede solutions.

<sup>10</sup>Relatedly, local and Indigenous control can improve conservation. Dawson et al. (2021) find from 159 studies that conservation efforts are most likely to achieve positive environmental and community outcomes if they have meaningful local and Indigenous participation. Similarly, Becker and Ghimire (2003) argue that traditional Indigenous knowledge can help protect ecosystems in common property systems, especially in conjunction with conservation science.

<sup>11</sup>Some new work studies the distributional impacts of markets introduced by policy (e.g., Hernandez-Cortes and Meng 2020).

about human rights, land tenure, customary rights, equity, and local participation. In some cases, projects were started before communities had even learned about them (Griffiths and Martone 2009; Espinoza Llanos and Feather 2011). REDD+ was designed to do better by embracing goals such as Indigenous rights (Alix-Garcia and Wolff 2014; Angelsen et al. 2018). However, some REDD+ projects still do not incorporate local perspectives (e.g., Ituarte-Lima, McDermott, and Mulyani 2014; Sunderlin et al. 2014). In some cases, project documents are not translated for local communities (Ituarte-Lima, McDermott, and Mulyani 2014) or community members simply do not understand the projects (Sunderlin et al. 2014). Local communities strongly objected to the Tanzanian government's policy to monetize wildlife for sport hunting and safari tourism, but their voices were ignored (Benaminsen et al. 2013), and local Zambian communities were excluded from decision-making regarding the creation and operation of a game management area (Lindsey et al. 2014). This exclusion is procedurally unjust; further, local voices have instrumental value in predicting problems like those we describe here.

Ecosystem services are benefits provided by ecosystems, such as carbon storage in forests. Markets for ecosystem services theoretically provide benefits by creating value that incentivizes ecosystem protection. However, the value they create also incentivizes those with financial capacity (usually governments and well-resourced private actors) to try to expropriate those values. For example, in Africa, recent decades have seen a surge in private acquisitions of previously commonly held land (Wily 2011). In Peru, "carbon pirates" have convinced Indigenous communities to give up land rights on terms beneficial to commercial interests (Espinoza Llanos and Feather 2011). In Tanzania, state and private actors have participated in the seizing of natural resources for conservation markets, sometimes known as "green" or "blue" grabbing (Benaminsen and Bryceson 2012). REDD projects have also resulted in conflicts over land and resources (Espinoza Llanos and Feather 2011). Even in a REDD+ project in Tanzania with extensive community engagement, social safeguards, good governance principles, and a pro-poor approach, the imposition of new property rights sparked land disputes between previously cooperative villages, restricted communities' access to assets on which they had previously relied, and brought economic and physical displacement (Scheba and Rakotonarivo 2016). Even if land is not expropriated, the surplus created by conservation markets may be taken away from communities. In northern Cameroon, sport-hunting revenues are claimed by the state, and local communities near hunting reserves have been forced to migrate (Yasuda 2012). In Tanzania, the state took property rights to wildlife for sport hunting and tourism away from communities, at times violently (Lindsey et al. 2014).

## Looking Forward

ENRE seeks to improve human welfare through better stewardship of the environment and natural resources. Although the field has made many important contributions through wiser policy, some ENRE work can, despite good intentions, exacerbate racial inequity by prizing efficiency over equity, overlooking procedural justice, abstracting away from equity-relevant complexities, and focusing on narrow conceptions of relevant problems. Although this article has highlighted ways that key conceptual and methodological approaches in ENRE may

unintentionally uphold and reinforce systemic racism, we are optimistic that the field can innovate to address these problems.

Some innovations follow the lead of the scholars who are already advancing research on social and environmental justice. Our profession's notable recent interest in these areas, as illustrated by publications in top economics journals and by plenary and thematic sessions at the 2022 and 2023 AERE conferences, offers an opportunity for ENRE scholars to pursue and be recognized for research in these areas. ENRE researchers can explore ways to improve tools and models with greater emphasis on features such as distribution of welfare. Careful measurement of unequal impact is valuable (Sheriff and Maguire 2020), and scholars can build distributional concerns into BCAs with equity weights (Fleurbaey and Abi-Rafah 2016; Wagner et al. 2021). Research can further advance thinking about common ownership as a complex but well-defined type of property right (Ferraro and Agrawal 2021), and tools like nonmarket valuation can be enriched to account for structural racism. In some cases, ENRE models will need to be made more complex to reflect important context, although humility with regard to our models' predictive powers will always be needed.

Other innovations will be needed to bridge broader gaps to tackle thorny problems of environmental and racial injustice. ENRE research could engage more with procedural justice by bringing local knowledge or preferences into policy analysis (e.g., Walker and Baxter 2017) or through community-engaged research, an approach that involves affected communities meaningfully in the conception and execution of research on the problems they struggle with (e.g., Lewis and Sadler 2021). The discipline should also reward work that is more ambitious in studying questions with racial justice implications even when clean causal identification is not possible, recognizing that suggestive evidence related to crucial questions is still important. In these efforts, ENRE scholars should engage more with environmental scholars in other fields and race scholars within all fields. That engagement could, for example, seriously entertain critiques of ENRE's very conceptions of value and form multidisciplinary collaborations with scholars grounded in the study of race and racism. All of these changes must come not only from individual scholars but also from gatekeepers such as journal editors and tenure letter writers.

Other efforts in the field could complement these advances. Notably, members of the field engaged in teaching can improve what and how they teach. Instructors and textbooks can present a broader and more balanced treatment of concepts, methods, and issues, with discussions of the social justice issues relevant to ENRE. Curricula could confront rather than embed discriminatory elements.<sup>12</sup> More generally, as students become more diverse, ENRE educators should contemplate how their teaching must evolve in response, as well as the opportunities this diversity presents (Bayer, Hoover, and Washington 2020). Current scholars can learn much from new students, particularly given the present limited demographic diversity of the field (which can be self-perpetuating). If ENRE better engages with issues of social inequities and racial justice, scholars passionate about racial equity may be more likely to persist in, and share their insights with, economics rather than leaving for other fields.

<sup>12</sup>For example, although Hardin's "Tragedy of the Commons" (1968) is a common reading in ENRE courses, it may be time to reconsider whether or how it should still be taught. Teaching it without acknowledging its troubling content and the eugenic zeitgeist it was part of (Oakes 2016) may alienate budding scholars.



ENRE scholars also should be mindful of how their scholarly output will be used. Past misuses of research show that researchers have an obligation to provide better guidance for users of their analyses. Rather than defer value judgments to downstream decision makers, especially when judgments that could damage vulnerable groups are foreseeable, researchers can communicate more thoroughly the normative implications of their work, including with regard to social and racial justice.

This article is not the first to document most of these issues, but, in presenting them together, it tells the story of a field that means well but could do better. The world is in a racial justice reckoning, and ENRE scholars (including we, the authors) would do well to learn how we are implicated and to work actively against racial inequity rather than perpetuating it (Kendi 2019). Although this article has attempted to outline several key issues and offer constructive suggestions, we recognize that we have not enumerated all of the field's challenges, and we further acknowledge that we do not have all of the solutions. Instead, we write this article in hopes of broadening the conversation. We invite all ENRE scholars and the general economics profession to take part.

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