

Toward Environmental Democracy? Procedural Environmental Rights and Environmental Justice

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Abstract

The global trend toward adopting environmental rights within national constitutions has been largely regarded as a positive development for both human rights and the natural environment. The impact of constitutional environmental rights, however, has yet to be systematically assessed using empirical data. In particular, expanding procedural environmental rights—legal provisions relating to access to information, participation, and justice in environmental matters—provides fertile ground for analyzing how environmental rights directly interface with conditions necessary for a functioning democracy. To understand the extent to which these provisions deliver on their lofty aspirations, we conducted a quantitative analysis to assess the relationship between procedural environmental rights and environmental justice, while also controlling for the extent of democracy within a country. The results suggest that states with procedural environmental rights are more likely than nonadopting states to facilitate attaining environmental justice, especially as it relates to access to information.

States have long sought to address environmental changes experienced at the national level by adopting environmental policy innovations whose origins lie at the global level. Such innovations include environmental institutions, instruments, laws, and policies (Busch and Jörgens 2005, 80). One noteworthy development among these areas involves the global expansion of constitutionally instantiated substantive human rights to the environment (SERs), a phenomenon that has garnered an increasing degree of attention by legal scholars, philosophers, and social scientists (e.g., Shelton 1991; Brandl and Bungert 1992; Nickel 1993; Anderson 1996; Dommen 1998; Atapattu 2002; Hancock 2003; Hayward 2004; May 2005; Ebeku 2007; May and Daly 2009; Boyd 2012; Bratspies 2015). Far less attention, however, has been paid to the emergence and effect of constitutionally

* We thank Jim May and Erin Daly for supporting this work through the Visiting Scholar-in-Residence in Global Environmental Constitutionalism program at Widener University Delaware Law School. We also thank Steinar Andresen, Stacy VanDeveer, Michele Betsill, the *GEP* editors, and three anonymous reviewers for their useful comments.

entrenched procedural environmental rights (PERs)—constitutional provisions relating to access to information, access to justice, and participation in environmental matters (May and Daly 2014, 44). This oversight is surprising given that PERs may constitute “the most important environmental addition to human rights law since the 1992 Rio Declaration on Environment and Development” (Boyle 2012, 616). At the international level, PERs emerged from Agenda 21, which states that “one of the fundamental prerequisites for the achievement of sustainable development is broad public participation in decisionmaking.”¹ While such rights find explicit recognition in more than thirty national constitutions (May and Daly 2015, 77), many environmental laws throughout the world serve similar purposes, especially with regard to participation in environmental decision-making (May and Daly 2014, 37). For instance, national environmental impact assessment (EIA) regulations mandate public input on planned projects in an effort to “assess their probable impact on the environment and to explore measures to eliminate or mitigate such impact” (Popović 1993, 699). As such, EIA laws represent the practical embodiment of the participatory aspect of PERs.

Reasons to believe that PERs matter for the environment, the pursuit of environmental justice, and the quality of democratic governance in a state are compelling. Substantial evidence demonstrates that where environmental policy incorporates procedural rights, environmental protection efforts are more robust (Conca 2015, 108). Achieving environmental justice requires that vulnerable communities have opportunities to participate meaningfully in decision-making processes (Kuhn 1999, 648). Finally, equipping underrepresented groups with environmental information and avenues for influencing policy decisions strengthens the values and practices associated with democracy (Daly 2012, 78). However, although legal scholars and green theorists have debated the political and ecological merits of PERs (often without dialoguing directly), scant work has sought to assess systematically the extent of their impact on the ground. We aim to correct for this lacuna by analyzing the efficacy of PERs empirically. We first outline the critical and instrumental challenges to effective actualization of PERs. Then, deploying a global statistical analysis, we examine the effect that PERs have on promoting environmental justice. We find that PERs, specifically those pertaining to access to information, relate positively to outcomes associated with environmental justice and sustainability—a result that holds when we control for level of democratic governance. Furthermore, we find that countries with greater “net” institutionalized democracy are more likely to report greater access to improved water and sanitation facilities.

1. UN GAOR, 46th sess., Agenda Item 21, UN Doc A/Conf.151/26 (1992), “Agenda 21: Programme of Action for Sustainable Development,” available online at: <https://tinyurl.com/mzag5st>, last accessed November 27, 2017.

Critiques Regarding the Utility of PERs

Some theorists have challenged the utility of constitutionally entrenched PERs. Although some such claims are fair, several critiques regarding constitutionally embedded PERs rest on faulty theoretical foundations and conceptual misunderstandings. In this section, we address these arguments in an effort to bring greater clarity to the aims and scope of procedural rights in environmental matters.

Green theorists remain divided on the usefulness of PERs, given concerns regarding their instrumental value. These analysts contemplate whether PERs imply substantive improvements to the environment. Some paint the issue as a strict dichotomy: “[PERs] either imply a modification of the substantive ends of government or they do not” (Hayward 2004, 87). Others assert that the relationship runs the other way: “the effectiveness of any substantive environmental rights presupposes the establishment of a wide range of environmental procedural rights” (Eckersley 1996, 224). Still others suggest indirect environmental benefits generated through exercising PERs (Prugh et al. 2000, 96).

The central question involves deciding whether PERs are means to substantive ends or are rather ends in themselves. The answer will determine whether such rights serve a purpose above and beyond the aim of conventional procedural rights. Some have contended that PERs are necessary and distinguishable from traditional procedural rights. In particular, they provide an avenue for transparency where traditional procedural rights exempt certain activities on the basis of protecting, *inter alia*, national security or trade secrets (May 2013, 40). They also provide guidance for establishing at what point in the decision-making process environmental groups should be included (Knox 2013, 11). If PERs are phrased as such because they promote pro-environmental outcomes, they must therefore presume, work in furtherance of, and function subserviently to a SER that articulates the desired end state, however imprecisely. Such a conclusion would render dubious the utility of PERs—at least where they are enacted in the absence of other enabling environmental rights provisions. However, PERs hold the potential to

facilitate a robust “green public sphere” by providing fulsome environmental information and the mechanisms for contestation, participation, and access to environmental justice ... mechanisms [that] are not only ends in themselves but also means to enhance the reflexive learning potential of both the state and civil society. (Eckersley 2004, 140)

The problem with evaluating PERs against the yardstick of environmental improvement or safeguarding is that doing so denies the impacts these rights can have in the areas of democracy, environmental justice, and sustainability. These oversights result from ignoring the literature on participation theory and misunderstanding key concepts in the field of environmental politics. In the space below, we seek to resolve these tendencies and bolster the case for adopting PERs.

Public participation is necessary for the existence of a democratic society (Pateman 1970, 43; Renn et al. 1993, 210). It “engenders civic competence by building democratic skills, overcoming feelings of powerlessness and alienation, and contributing to the legitimacy of the political system” (Fiorino 1990, 229). Perhaps as importantly, it serves an educative function by teaching citizens to understand the difference between individual desire and common interest and equipping them with the knowledge and confidence needed to engage in participatory activities. In this sense, participation cultivates “the very qualities necessary for it; the more individuals participate the better able they become to do so” (Pateman 1970, 42–43).

Participation is central to the notion of environmental democracy, which privileges collective decision-making among citizens above decisions based solely on administrative, professional, or scientific expertise (Fischer 1993, 176). Empirical research demonstrates that participation in environmental governance enhances the likelihood that government agencies will be held accountable to the public; infuses local knowledge into decision-making processes; increases popular support for policies; and produces higher-quality planning outcomes (Laurian 2004, 53), environmental decisions (Reed 2008), and conservation efforts (Sultana and Abeyasekera 2008). Advocates of PERs have echoed these benefits (Daly 2012; May and Daly 2014).

In the course of analyzing the relationship between participation and environmental protection, green theorists have overlooked important insights from the literature on participation theory. In particular, they have neglected discussions regarding how to define success and different methods of public participation. By conceiving participation narrowly, these scholars limit the identifiable range of benefits that participation may confer on citizens and their surroundings. In terms of defining success, participatory processes may be evaluated according to the extent to which they achieve outcome goals or process goals (Chess and Purcell 1999, 2685). For obvious reasons, green theorists have concentrated their analyses almost exclusively on outcome goals (i.e., improved environmental quality). However, we argue that process goals (i.e., fairness, information exchange, etc.) are worthy of consideration even if evaluation remains focused on identifying positive changes in the natural environment. The reasons why process goals remain important in their own right will be examined in greater detail later, in the context of environmental justice and sustainability.

Green theorists also have spared scant space to assess the relative merits of different methods of public participation. However, “‘public participation’ encompasses a group of procedures designed to consult, involve, and inform the public to allow those affected by a decision to have an input into that decision” (Rowe and Frewer 2000, 6) and ultimately to challenge an unfavorable decision. Different forms of participatory processes have been shown to yield a variety of results that improve environmental governance. Aside from commonly practiced participatory activities, such as advisory committees, public comment

periods, public hearings, public surveys, town hall meetings, and workshops, more innovative methods, such as study circles, citizen juries, roundtables, and collaborative watershed management, have proven capable of building civic capacity and bringing into the fold citizens who do not normally participate in the policy-making process (Konisky and Beierle 2001, 823). That green theorists do not consider alternate methods of participation restricts the kinds of conclusions they can draw regarding the potential of PERs.

In addition, the two other forms of PERs—access to information and justice—similarly hold the potential to strengthen democracy in ways that may serve to benefit the environment. Ensuring access to information on environmental matters enhances the capacity of citizens to check abuses that public or private actors commit. For instance, an informed public can monitor and challenge government decisions related to climate change and possible human rights violations caused by government (in)action on the issue (Kravchenko 2007, 29; 2010, 6). Access to justice in environmental matters might also enhance prospects for democracy, as it offers a means of clarifying and expanding the scope of parties eligible to bring a case before a court, thus articulating who possesses the right to take part in judicial proceedings (May 2013, 42). Such a right may prove useful given that legal issues involving the environment often animate questions regarding who is entitled to represent the interests of the aggrieved where harms are diffuse or the injuries more abstract.

Another domain that has provided a basis for the instrumental critique of PERs is environmental justice. However, scholars have occasionally used an incomplete definition of environmental justice, which has led to the assertion of claims based on faulty premises. For instance, Dobson (2003), Woods (2006), and Latta (2007) all described environmental justice exclusively in terms of distributing environmental “bads” so that they are not all located in areas populated by marginalized groups. Conceptualizing environmental justice in this way characterizes the movement as accepting environmental harms so long as they are shared equitably among members of society. This construction also suggests that, at best, PERs can provide a democratic vehicle with which vulnerable communities can shift environmental and public health burdens to other geographic locations.

However, a fuller account of environmental justice entails that the aim of the movement advocates “that environmental bads should be eliminated at the source” through a process deemed just by affected communities (i.e., a combination of substantive or distributive and procedural justice) (Agyeman et al. 2002, 82). This means that environmental justice outcomes relate not only to the equitable distribution of environmental goods or bads (i.e., distributive justice) (Kuehn 2000, 5); they also involve “efforts to increase the access of all populations to environmental decision-making processes” (Pearsall and Pierce 2010, 570). The emphasis on the role of participation in reaching decisions in environmental governance has “always been part of environmental justice discourse” (Schlosberg 2013, 40), and PERs offer a means of legalizing this

element of environmental justice. At the same time, access to decision-making procedures does not imply the realization of environmental justice. One must also observe “whether the process is designed in a way to lead to a fair outcome” (Kuehn 2000, 9).

Participation facilitated by PERs also has another important consequence not appearing under the banner of environmental outcomes: empowerment, understood here to mean “a mechanism by which people, organizations, and communities gain mastery over their affairs” (Rich et al. 1995, 659). Through active participation in environmental decision-making, citizens can (re)assert control over their destinies and become empowered to engage in future participatory processes (Rogers et al. 2006, 230). Indeed, several of the implementation reports submitted by parties to the Aarhus Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters indicated that PERs helped to empower civil society, thus bolstering the likelihood of realizing substantive improvements in environmental quality (Mason 2010, 25–26). To wit, legal scholars have asserted that PERs can aid in realizing both outcome *and* process goals. In the context of climate change, PERs enable members of civil society to provide inputs into national reports required by the UN Framework Convention on Climate Change, strengthening the accuracy and transparency of efforts to limit greenhouse gas emissions, while participation of a wide range of stakeholders during international climate change negotiations can improve the likelihood that resulting adaptation and mitigation policies incorporate the perspectives of those most vulnerable to the harmful effects of climate change (Kravchenko 2010, 648). In short, PERs offer a means of empowering individuals and groups that have been historically disadvantaged in environmental governance. Empowerment figures prominently in the concept of sustainability, to which we turn next.

Sustainability is often described as the nexus of economic, social, and environmental spheres of life. While interrelated, these entities remain distinguishable from one another (Goodland 1995). Exploring the contours of sustainability allows us to understand the usefulness of PERs outside the context of strictly environmental outcomes. Applying the constituent elements of sustainability accurately is crucial to this examination, especially because the instrumental critique of PERs rests on a fundamental misunderstanding about how rights figure into the larger conceptual framework. Theorists such as Dobson (1999), Woods (2006), and Latta (2007) have discussed environmental justice in terms of its logical relation to *environmental* sustainability. Although not wholly indefensible, this maneuver moves the goalposts to an inappropriate distance given that the more immediate benchmark would be *social* sustainability, which “is related to both equity and participation” (Jacobs 1999, 38). Whereas participation has been thoroughly explored earlier in this article, equity consists of two major elements: *inter*-generational equity (which requires that the present generation maintain or enhance the biosphere for the sake of future

generations) and *intra*-generational equity (which holds that past and present injustices among existing communities around the world must be addressed). Safeguarding human rights and increasing public participation advance the prospects for intragenerational equity (Richardson and Wood 2006, 14–15). This “social dimension” is of particular import, as “the unjust society is unlikely to be sustainable in environmental or economic terms” (Haughton 1999, 234). Yet, it is precisely the social dimension of sustainability that is often given short shrift in the literature on sustainable development (Giddings et al. 2002, 189).

As to whether PERs can assist in the pursuit of social sustainability, the answer stands more definitively in the affirmative. *Our Common Future*, the now iconic report by the World Commission on Environment and Development, explicitly acknowledges the importance of procedures designed to democratize access to environmental decision-making in sustainable development—the practical roadmap for implementing sustainability: “Most important, effective participation in decision making processes by local communities can help them articulate and effectively enforce their common interest” (World Commission on Environment and Development 1987, 47), which, as indicated earlier, may or may not result in environmental protection. The report later emphasizes the significance of empowerment, mainly in regard to indigenous groups, and describes how legacies of political exclusion must give way to cultural recognition and provide avenues for underrepresented people to play a decisive role in determining the use of local resources. Therefore, having already established that PERs are conceived to enhance the prospects for participation in environmental governance and empower individuals to take part in participatory processes, it stands to reason that such rights help to achieve social sustainability most directly and that criticisms regarding their inability to procure environmental sustainability are founded on a conceptual mismatch.

In this section, we have countered claims by green theorists that PERs might not add value if their realization does not result in substantive improvements to the environment. We have demonstrated that the instrumental critique does not hold because it presumes that the only useful outcomes are those that pertain to the natural environment, which is a view based on flawed premises. More specifically, we have argued that PERs contribute substantively to democracy, environmental justice, and social sustainability, with environmental benefits likely to emerge where these areas are promoted. The following section presents a statistical analysis of the effects of PERs around the world, preceded by a brief discussion of related empirical studies.

Previous Empirical Work on Constitutional Rights and Human Rights Outcomes

There is a growing literature that examines the effects of constitutional provisions for economic and social rights on economic and social outcomes. Matsuura

(2013) explores data from 157 countries from 1970 to 2007 to assess whether the constitutional right to health has an effect on population health and, for countries with increasing levels of democratic governance, finds that including such a right can be an effective mechanism to improve health outcomes. Considering the right to education and educational outcomes, Edwards and Marin (2014) find no discernible relationship between having said constitutional right and higher test scores. On the basis of the Social and Economic Rights Fulfillment (SERF) Index (Fukuda-Parr et al. 2015), Kaletski et al. (2015) demonstrate a positive relationship between constitutional economic and social rights provisions on government fulfillment of said rights as measured by the SERF Index. Using cross-sectional data within an instrumental variables framework, Minkler and Prakash (2017) find a negative and statistically significant causal relationship between having constitutional economic and social rights provision and poverty.

Beginning with Boyd (2012), a handful of quantitative studies have aimed to explore (1) why countries adopt constitutional environmental rights (CERs) and (2) the relationship between CER provisions and environmental (human rights) outcomes. With respect to the former, research demonstrates that environmental constitutionalism is significantly associated with the presence of international civil society organizations, past human rights performance, and a state's level of democracy, but not with regional influences (Gellers 2012, 2015). In addition, statistical analyses indicate that countries are more likely to include environmental rights provisions in their constitutions if they are younger, if they have a growing number of other constitutional economic and social rights, and if a growing number of national constitutions have environmental rights provisions (Jeffords and Minkler 2016). These findings resonate with those of Elkins et al. (2013), who note that the International Bill of Human Rights—the collection of documents from which most economic and social rights derive—has had a coordination effect on national constitution makers. As to the latter, economists have identified a causal link between having a CER provision within a constitution and environmental outcomes (Jeffords and Minkler 2016), as measured by the Environmental Performance Index (Yale Center for Environmental Law and Policy et al. 2012). Furthermore, a study of 190 countries over the period 1990–2012 concludes that although limited evidence exists that CERs affect access to improved sanitation, there is a positive and statistically significant relationship between aging CER provisions and access to improved drinking water sources (Jeffords 2016).

Although many studies examine the role of *substantive* CERs on various outcome measures, this article is seemingly the first to consider the effect of constitutional *PERs* on outcomes. In particular, we consider not only the effect of PERs but also the value-added of particular PERs when a given constitution already includes a SER. The following section outlines our empirical strategy as it relates to the value-added of three specific PERs: information, participation, and justice.

Empirical Strategy

Our strategy is entirely one of demonstrating conditional correlations between the selected variables and in no way has causal implications. In an effort to control the “future predicting the past,” we implemented a cross-sectional framework using OLS by regressing explanatory variables for country i in period t on dependent variables for country i in period $t + 1$.² We expect that SERs could serve a similar role to PERs in terms of increasing access to environmental justice. Furthermore, we are interested in the value-added of PERs and thus build our empirical framework in steps. We first consider specifications including a dummy or indicator variable for the presence of a SER. We then consider specifications including a dummy variable for the presence of a PER.³ These two specifications are obviously prone to omitted variables bias, but each provides a baseline estimate of the effect of each type of right on the environmental outcome. To then consider the joint effect of SERs and PERs, we introduce a specification including both rights as separate dummy variables and another where we interact both rights and include it as single dummy variable. The former specification provides an estimate of the effect of a PER on the outcome variable while controlling for the presence of a SER. In addition to the interaction term, the latter specification also includes the two rights as separate indicator variables.⁴ We recognize that although these simple difference of means tests suffer from estimation bias, each offers a relatively simple interpretation of the effect on the conditional mean of the dependent variables of having a SER, a PER, or both.⁵

A Brief Description of Interpreting Interaction Terms

In an effort to further clarify our primary empirical findings, we provide a supplementary appendix where we demonstrate how to calculate the coefficient estimates for the interaction terms presented below, and we also present the results of additional model specifications. Based on the discussion in our online appendix, which is derived from sections found in Gujarati (2003) and Stock and Watson (2003), the effect of adding a PER to a constitution with an existing SER is found by adding the coefficient estimates attached to the PER and the interaction term, if and when they are statistically significant.

2. See the online appendix for a discussion our choice of estimation methodology: http://www.mitpressjournals.org/doi/suppl/10.1162/GLEP_a_00445
3. We also tested the effect of having some combination of PERs (or any or all PERs), but the results did not yield a statistically significant impact stemming from this measure of PERs or its interaction with the SER.
4. See the online appendix for a full description of the principal model used to estimate various specifications.
5. In addition to these specifications, we considered a secondary framework that took into account the age of the environmental rights provisions. See the “Temporal Robustness Checks” section of the online appendix for more information.

Data and Primary Dependent and Independent Variables

The primary data consist of observations for 198 countries as of 2009–2010.⁶ As a result of missing data either for the dependent or independent variable, the observation count across the models ranges between 100 and 200. The remainder of this section outlines the primary dependent and independent variables.

The primary dependent variables are taken from *World Development Indicators 2014* (World Bank 2014) and include (1) percentage of the urban (rural) population with access to improved water sources, (2) percentage of the urban (rural) population with access to improved sanitation facilities, (3) an average of the percentage of urban (rural) population with access to improved water sources and sanitation facilities, and (4) per capita carbon dioxide emissions in metric tons.

Whereas the first three variables are considered human rights outcome indicators, the last is a typical measure of environmental quality. The primary focus of the empirical literature has typically been directed at environmental outcomes or measures of environmental quality, such as the Ecological Footprint (Boyd 2012) and the Environmental Performance Index (Jeffords and Minkler 2016). Concurrently, however, there is a nascent literature linking CER provisions to human rights outcomes (Jeffords 2016) and a related literature linking PERs to specific human rights outcomes, such as sanitation and water quality (Musembi 2014; Zimmer et al. 2014). To thus account for the possibility that SERs and/or PERs could impact human rights outcomes, environmental outcomes, or both, we consider a subset of the two types of outcomes.

We selected 2009–2010 as the two-year time period for the econometric framework based on data restrictions. Although the access to water and sanitation variables are available through 2012, data on carbon dioxide emissions were limited to 2010, and so we use 2009–2010 as the time period for the lagged cross-sectional analysis.

The primary independent variables are taken from May and Daly (2015, Appendixes A and I). Their Appendix A lists all of the countries whose constitutions include SERs, whereas their Appendix I lists all of the countries whose constitutions include any one of the three PERs to information, participation, or justice. The coding of these data is simple: denote with a “1” if the country has the right in its constitution, “0” otherwise. Approximately 71 countries out of the 198 have a SER, while 19, 11, and 16 have PERs to information, participation, and justice, respectively.

We also include POLITY from the POLITY IV Project of the Center for Systemic Peace. POLITY scores range from –10 (strongly autocratic) to +10 (strongly democratic) and function as a measure of democracy. To control for

6. See the online appendix for a table of summary statistics (Table A1) and a cross-tabulation between having (or not) a SER and having (or not) a given PER (Table A2). We further control for temporal issues by excluding from the analysis all countries whose constitutions are newer than 2009.

estimation variance, we convert POLITY to the unit interval (i.e., 0–1) scale, where a value closer to 1 indicates a strongly democratic regime and a value closer to 0 indicates a strongly autocratic regime.⁷ Although research shows that the relationship between democracy and environmental performance is mixed (Duit 2014, 14), corruption negatively impacts environmental policy, whereas democracy increases the stringency of environmental policy (Pellegrini and Gerlagh 2006), the rule of law has a positive effect on environmental policy stringency (Chen 2017), and human rights protection correlates strongly with good governance (Reif 2000). These findings suggest that quality institutions and good governance are positively associated with environmental rights outcomes and democracy. A government responsive to the needs of its citizens should be more inclined to take action to address environmental problems where and when they occur. Therefore we expect the effects of PERs on environmental justice outcomes to be more profound when controlling for a country's level of democracy than when regime type is left out of the equation.

Additional controls include ratification of and/or accession (by 2009) to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and, from the Comparative Constitutions Project (Elkins and Ginsburg 2014), the constitutional right to view government files.⁸ We include the former in an effort to control for the international trade avenues through which environmental justice outcomes might be impacted, and the latter to proxy for the notion that other (nonenvironmental) procedural rights can impact environmental justice outcomes. To control for the economic or financial ability to improve environmental justice outcomes, we include the natural log of the purchasing-power-parity adjusted gross domestic product per capita (also from the *World Development Indicators 2014* [World Bank 2014]). Lastly, to take into consideration exogenous geographic issues, such as the dispersion of water resources, we group countries into the following categories: Eastern, Central, and Southern Asia and the Pacific; Europe, Middle East, and North Africa; North America; Latin America and the Caribbean; Oceania; and the base region, Sub-Saharan Africa. But like most cross-sectional analysis at the country level, much of the variation in the dependent variables tends to be attributed to the measures of national income and exogenous geographic controls once included.

7. Countries with both a POLITY score and PER to information ($n = 18$), participation ($n = 11$), or justice ($n = 16$) have average POLITY scores of 0.733, 0.764, and 0.725, respectively, indicating that (on average) countries with a PER tend to be more democratic than autocratic.
8. Thanks to an anonymous referee, we also considered ratification/accession status of the Aarhus Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters but excluded it from the analysis as it applies solely to European countries and greatly reduces the observation count. Countries that are not in Europe cannot participate directly in this convention, and therefore a dummy variable value of zero is qualitatively different from a European country with a dummy variable value of zero.

Results and Discussion

PER to Information

The results we obtained by estimating various iterations of equation (2) from the online appendix are displayed in Tables 1a and 1b. One striking result is that the percentage of the population with access to water, sanitation, and water and sanitation combined (across both urban and rural areas) is significantly larger for those countries with a PER compared to those without one. For example, countries with a PER to information report (on average) that urban access to water is 4.379 percentage points higher and rural access to water is 12.89 percentage points higher. When controlling for both rights and including the interaction term, the combined effect as measured from equation (5) also in the online appendix (http://www.mitpressjournals.org/doi/suppl/10.1162/GLEP_a_00445) yields a statistically significant positive impact on the reported access variables with the exception of no (statistical) effect on rural access to sanitation. Within the rural access to water model, for example, the total effect of having a PER and SER is found by adding 8.653 and 12.54 to obtain 21.193. This implies that countries with both PER and SER have, on average, a rural access to water percentage that is 21.193 points higher (on a scale of 0–100). With respect to rural access to sanitation, however, there is arguably no effect in this simple specification.

It is also interesting that the presence of a SER is negatively related to the access variables and is sometimes highly statistically significant. For example, having a SER is associated with an average reduction in the percentage of the rural population with access to water of 9.358 percentage points. We think this and other similar negative results are a potential side effect of omitted variables bias (or simply the fact that the distribution of countries is highly skewed toward not having a PER to information). In fact, as displayed in Table 2, the negative effect is dampened, as is the statistical significance, when we include additional controls. Furthermore, Jeffords (2016) finds a positive relationship between a similar data set of environmental rights and the same access to water variables, but set within a more robust panel framework accounting for many additional control variables.

As shown in Table 1b, the results tell a different story in terms of the relationship between CO₂ emissions and having a SER and/or PER. The presence of a SER is negatively related to CO₂ emissions, indicating that having a SER to a healthy or clean environment is in some way related to reductions in CO₂ emissions. At the same time, however, there is not much of a relationship between having a PER and CO₂ emissions or adding a PER to a constitution with an existing SER. These results are interesting, because the access variables are not traditional measures of environmental quality, while CO₂ emissions are one of the key measures of environmental quality, especially within the context of climate change. The findings thus suggest that while information PERs may help people identify individual environmental harms, they might not be useful for addressing environmental problems whose impacts are diffuse. This indicates the need

Table 1a

Estimation Results from the PER to Information Framework

	<i>Urban Access to Sanitation</i>		<i>Rural Access to Sanitation</i>	
SER	-1.213 (1.231)	-2.060 (1.287)	-2.201 (1.418)	-7.882** (3.187)
PER				
Information	4.379*** (0.868)	5.238*** (1.062)	4.201*** (0.793)	12.89*** (2.330)
SER × PER			1.518 (1.692)	17.79*** (3.116)
Information				
Constant	95.23*** (0.663)	95.02*** (0.670)	95.06*** (0.690)	85.67*** (1.709)
Observations	185	185	185	179
R-squared	0.006	0.044	0.045	0.036
Adjusted	0.000	0.024	0.029	0.031
R-squared				
				85.05*** (1.730)
				179
				0.101
				0.090
				85.37*** (1.772)
				179
				0.107
				0.092

Table 1a
(Continued)

	Urban Access to Sanitation		Rural Access to Sanitation	
SER	-5.183 (3.827)	-8.559** (3.981)	-9.020** (4.334)	-10.90* (5.673)
PER		16.21*** (2.466)	15.88*** (2.401)	20.30*** (6.200)
Information			5.732 (4.843)	25.12*** (7.661)
SER × PER				30.72 (21.15)
Constant	81.62*** (2.136)	78.23*** (1.932)	81.07*** (2.207)	67.96*** (3.176)
Observations	179	179	179	175
R-squared	0.011	0.040	0.068	0.055
Adjusted R-squared	0.005	0.034	0.052	0.044

Standard errors in parentheses. P-value notation: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Table 1b
Estimation Results from the PER to Information Framework

	Urban Access to Water and Sanitation		Rural Access to Water and Sanitation		Per Capita CO ₂ Emissions (Metric Tons)				
SER	-2.941 (2.332)	-5.078** (2.412)	-5.354** (2.627)	-6.919* (4.063)	-11.33*** (4.177)	-11.99*** (4.469)	-2.237** (0.797)	-2.518*** (0.783)	-2.821*** (0.829)
PER		10.48*** (1.512)	12.74*** (1.932)	10.25*** (1.497)	19.64*** (2.832)	25.14*** (3.671)	17.39*** (3.580)	0.904 (1.071)	1.857* (2.189)
SER × PER			3.411 (2.959)		9.932* (5.682)				2.967 (2.446)
Constant	88.17*** (1.311)	86.10*** (1.179)	87.72*** (1.317)	87.81*** (1.353)	76.89*** (2.341)	72.49*** (2.071)	76.41*** (2.404)	5.873*** (0.671)	5.784*** (0.681)
Observations	177	177	177	172	172	172	172	189	189
R-squared	0.010	0.045	0.072	0.073	0.018	0.051	0.094	0.027	0.034
Adjusted	0.004	0.040	0.061	0.057	0.012	0.045	0.083	0.022	0.024
R-squared									

Standard errors in parentheses. P-value notation: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Table 2

Full Estimation Results for the 2010 Rural Access to Water Outcome Variable

SER	-7.882** (3.187)	-10.88*** (3.280)	-11.89*** (3.542)	-14.01*** (3.838)	-8.537*** (2.854)	-7.847** (3.093)	-6.945** (2.953)
PER Information	12.89*** (2.330)	17.79*** (3.116)	8.653*** (3.056)	7.828*** (2.794)	5.306** (2.551)	-4.169 (2.881)	2.165 (3.563)
SER × PER Information			12.54*** (4.806)	16.66*** (4.713)	10.33** (4.249)	10.58** (4.267)	9.352** (4.449)
Polity IV				22.71*** (5.823)	16.41*** (4.229)	14.32** (6.911)	15.29** (6.159)
Rotterdam				7.803* (4.150)	3.630 (3.208)	5.627* (3.204)	3.986 (3.125)
Constitutional Right to View Government Files				4.272 (3.637)	3.971 (2.615)	-0.980 (2.932)	1.451 (2.576)
Real GDP per Capita					10.08*** (1.052)		7.847*** (1.588)
Constant	85.67*** (1.709)	81.63*** (1.603)	85.37*** (1.772)	59.98*** (5.702)	-24.71** (10.17)	50.21*** (5.256)	-10.64 (13.24)
Geographic Controls	No	No	No	No	No	Yes	Yes
Observations	179	179	179	107	105	107	105
R-squared	0.036	0.037	0.107	0.313	0.667	0.603	0.699
Adjusted R-squared	0.031	0.031	0.092	0.272	0.643	0.552	0.656

Standard errors in parentheses. P-value notation: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

to further explore the practical implications of both SER and the PER to information as each relates to human rights outcomes and measures of environmental quality.

As we stepped through the various specifications of our model, evidence suggested that the value-added of a PER to information was diminishing.⁹ The statistically significant positive value-added only remained in the models where rural access to water was the dependent variable, which can be seen in Table 2. Also true, however, is that the statistical impact of the interaction term diminished as additional controls were added, such as the measure of national income and the geographic controls, and the explanatory power of the model increased from below 0.30 to above 0.60 with these specific controls.

Also seen in Table 2 is the consistently positive and statistically significant contribution from POLITY on the percentage of the rural population with access to water. In other words, the more democratic a country is, the more likely it is to report higher rural access to water. It also appears that a higher level of income per capita is positively related to rural access to water but that ratifying or acceding to the Rotterdam Convention and having a constitutional right to view government files are both statistically unrelated to rural access to water.

PERs to Participation and Justice

The results for the PER to participation are not as exciting. Based on Tables A3a and A3b in the online appendix, it is evident that the PER to participation is statistically unrelated to the dependent variables as an independent explanatory variable. The same can be said of the value added of a PER to participation. As for the PER to justice, its value-added appears to be negative in these simple specifications, based on Tables A4a and A4b. Within the urban access to water model, for example, the value added of a PER to justice is -2.455 (which is found by adding 4.339 to -6.794).

Similar to the buildup to the full model specification found in Table 2 for the PER to information, we examined various similar specifications for the PERs to participation and justice. The results were substantively the same for the PER to participation, while the negative value-added of the PER to justice was reduced to a statistically insignificant relationship with the dependent variables. In these specifications, POLITY and income per capita remained positively and statistically significantly related to the access variables. POLITY was statistically unrelated to CO₂ emissions, while a positive and statistically significant relationship persisted between income per capita and CO₂ emissions.¹⁰

9. Additional tables and discussion in the online appendix highlight and corroborate this finding from a temporal perspective, in particular, Tables A8–A12.
10. We ran sixty to eighty different model specifications for each of the three PERs, amounting to 180–240 sets of results. Because of space limitations, not all results appear here or in the online appendix. (Please contact the authors for more information.)

In general, the results were the strongest within the PER to information framework. Perhaps this stems from the idea that obtaining information about the status of the environment, especially in an age when information can spread so quickly through various means (e.g., computers and smartphones), is more of a practical matter that leads to behavioral changes than the right to participate in environmental matters or the right to remediation from environmental damages (e.g., justice). It is interesting that the value-added of a PER to information disappears as additional control variables are added, with the exception of its value-added to the percentage of the rural population with access to water. Perhaps this stems from the idea that the gains from information spread slowly to rural areas compared to urban areas, but that once information begins to spread and the capacity to spread information grows, people in rural areas are better able to access their procedural right to obtain information about the status of the environment. This is relative to urban areas, which may already have a dense population of people for whom the value-added of a PER to information is smaller because the diffusion of information is faster, perhaps easier to obtain, and, because of the population density, more likely to spread regardless of the existence of a PER.

Conclusions

The preceding empirical analysis suggests that constitutionally entrenched PERs, specifically those relating to information, are positively associated with environmental justice outcomes. Interestingly, the evidence indicates that while environmental rights of the substantive variety may lead to improvements in environmental quality, states that have adopted the procedural variant do not experience similar benefits to the natural environment. Instead, access to environmental information appears to support a more equitable distribution of environmental goods. With respect to POLITY being positively related to the various access variables, as partially seen in Table 2 and in greater detail in Tables A5a, A5b, A7a, and A7b in the online appendix, these findings offer some validation of the claim that democracy provides institutional conditions that promote environmental justice. Further research, especially case studies at the national and subnational levels, will be needed to trace the causal mechanisms that connect access to environmental information to conditions conducive to obtaining environmental justice. It may be the case, for instance, that justicial outcomes follow where access to environmental information empowers people to exercise more general rights to participation. Such an explanation would help resolve the controversy regarding the utility of participatory PERs. Importantly, this study demonstrates that, although the impact of PERs may not be primarily *environmental*, PERs hold certain promise for improving intragenerational equity, a key element in the *social* aspect of sustainability. As such, PERs may offer a useful tool for promoting environmental justice and achieving sustainability, conditions necessary to attain environmental democracy.

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Note: See the online appendix for a discussion of our choice of estimation methodology: http://www.mitpressjournals.org/doi/suppl/10.1162/GLEP_a_00445.

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