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Procedural Environmental Rights and Environmental Justice: Assessing the Impact of Environmental Constitutionalism

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The global trend toward the adoption of 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, the expansion of 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. In order to understand the extent to which these provisions deliver on their lofty aspirations, the authors conduct a quantitative analysis designed to evaluate the relationship between procedural environmental rights and environmental justice. The results demonstrate that states with procedural environmental rights are more likely than non-adopting states to facilitate the attainment of environmental justice, especially as it relates to access to information.

Keywords: environmental rights, constitutionalism, environmental justice, human rights, democracy, sustainable development

Introduction

The global expansion of constitutionally-instantiated substantive human rights to the environment (SERs) has been the subject of an increasing degree of attention by legal scholars, philosophers, and social scientists (Shelton 1991, McClymonds 1992, Nickel 1993, Anderson 1996, Popović 1996, Dommen 1998, Bruch *et al.* 2001, Rehbinder and Loperena 2001, Atapattu 2002, Hill *et al.* 2003, May 2005, Ebeku 2007, May and Daly 2009, Boyd 2012, Gellers 2012, 2015, Jeffords 2013, 2015, Jeffords and Minkler, 2014, Bratspies 2015). Far less attention, however, has been paid to the emergence and effect of constitutionally-entrenched procedural environmental rights (PERs)—constitutional provisions relating to access to information, access to justice, and participation in environmental matters (May and Daly 2014, p. 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, p. 616). While such rights find explicit recognition in more than 30 national constitutions (May and Daly 2015, p. 77), many environmental laws throughout the world serve similar purposes, especially on the subject of participation in environmental decision making (May and Daly 2014, p. 37).

While legal scholars and environmental theorists have debated the political and ecological merits of PERs (often without dialoguing directly), scant work has sought to systematically assess 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, enhance the prospects for environmental justice and sustainable development.

Critiques regarding the utility of PERs

Some theorists have challenged the utility of constitutionally-entrenched PERs in the first place. While some such claims are fair, we contend that most complaints about 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.

First, scholars approaching the subject from a critical perspective have questioned the ability of PERs to deliver justicial outcomes that sufficiently address the historical roots of global inequity and power disparities entrenched in modern institutions. According to this school of thought, PERs are ill-equipped to offer a corrective for the main antecedent of environmental injustice—colonialism. International human rights law ignores its own falsely justified sense of universalism derived from imposed Northern hegemony. As an instrument of imperialism, human rights constructs have failed to assess the culpability of a global economic system that has allowed the North to engage in human exploitation and environmental degradation at the expense of the South. A critical approach to human rights, these analysts argue, remains essential precisely because of its capacity to illuminate historical practices, narratives, and discourses that create(d) environmental injustice (Gonzalez 2015).

This argument, largely couched in terms of obtaining corrective justice, commits two errors. For one, it obscures the role played by national human rights law and similar state-level legal instruments in providing the conditions necessary for environmental justice. While paying passing mention to these national options, the critique mainly focuses on human rights law at the

regional and international levels. Yet, a growing body of jurisprudence in the developing world that takes aim at historical inequities and injustices through innovative adaptation of international environmental law offers evidence that states are capable of domesticating "imperial" bodies of law to right local wrongs (Puvimanasinghe 2009). The critical view, however, seems content on waiting for the North to offer reparations to the South, expanding the reach of accountability for human rights violations geographically and historically through existing international human rights bodies, and placing the onus on grassroots environmental justice groups to bring cases before regional human rights organizations.

The concurrent suspicion of and faith in regional and international entities held by critical theorists is curious given the expanding array of options for achieving environmental justice at the national level. Relying on regional human rights bodies for justicial outcomes on environmental issues might prove particularly problematic, as some are not yet widely receptive to public interest litigation (Schall 2008). In terms of viable avenues at the international level, 'there is an absence of effective judicial mechanisms, whereby nonstate actors can vindicate [] fundamental human rights and utilize the right of access to environmental information to reverse the ominous trends towards environmental degradation' (McCallion and Sharma 2000, p. 364).

In addition, the argument centered on corrective justice lacks an appreciation of the role that PERs play in redressing past and present grievances. This critical view requires that justice appeal to inequities that exist at the global level:

> …without addressing the underlying historic inequities, the current inequalities that have roots in colonial history, and the disproportionate burden that marginalized communities bear in relation to global environmental problems, the human rights paradigm will not be able to effectively address environmental injustices in the world today. (Atapattu 2015, p. 202)

However, such thinking neglects the corrective possibilities that inhere in domestic legal responses to these same global issues. Courts in Colombia, Ecuador, India, Latvia, Peru, Slovenia, South Africa, and South Korea have upheld rights to access, information, or participation in environmental matters, shifting power to claimants seeking rights-based authority in environmental decision making processes (May and Daly 2015, pp. 251–253). In addition, power differentials present during public participation activities can be effectively managed using creative techniques, which help to enhance the prospect 'that the participatory process is perceived to be both fair and valid by those inside and outside the decision-making process' (Reed 2008, p. 2422). While it may not be feasible to undo the harms associated with colonialism or eliminate the system of global capitalism, PERs afford some measure of corrective justice by granting marginalized groups the ability to influence present and future development activities. By arming vulnerable peoples with legal tools capable of helping them shape decisions regarding the natural environment, they move closer to 're-establish[ing] the initial equality' (Weinrib 2002, p. 349) present prior to the environmental injustice.

Second, environmental theorists dispute 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: 'Procedural environmental rights either imply a modification of the substantive ends of government or they do not' (Hayward 2004, p. 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, p. 224). Still others suggest indirect environmental benefits generated through the exercise of PERs:

> Deeper engagement by ordinary citizens…helps ensure that the system is maximally sensitive to the detection of problems; and it can provide the kind of political support for the long-term science necessary to develop and refine ways of managing ecosystems sustainably. (Prugh et al. 2000, p. 96)

The central question involves deciding whether PERs are means to substantive ends or ends in and of themselves. The answer to this inquiry will determine whether such rights serve a purpose above and beyond the aim of conventional procedural rights. If PERs are phrased as such because they promote the goal of achieving pro-environmental outcomes, they must therefore presume, work in furtherance of, and function subservient to a SER that articulates the desired end-state, however imprecisely. Such a conclusion would render dubious the utility of PERs—at least where enacted in the absence of other enabling environmental rights provisions. Yet, 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, p. 140)

The problem with evaluating PERs mainly against the yardstick of environmental improvement or safeguarding is that doing so denies the important impact 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, p. 43, Renn *et al.* 1993, p. 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, p. 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 subsequent 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, pp. 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, p. 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, p. 53), environmental decisions (Reed 2008), and conservation efforts (Sultana and Abeyasekera 2008). These benefits have been echoed by advocates of PERs (Daly 2012, May and Daly 2014).

In the course of critically analyzing the relationship between participation and environmental protection, environmental theorists have overlooked important insights from the literature on participation theory. In particular, they have neglected discussions regarding how to define success and the different methods of public participation. By conceiving participation narrowly, these scholars have inadvertently limited the identifiable range of benefits which

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, p. 2685). For obvious reasons, environmental 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.

Environmental 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, p. 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, round tables, and collaborative watershed management have proven capable of building civic capacity and bringing into the fold citizens who do not normally participate in the policymaking process (Konisky and Beierle 2001, p. 823). That green theorists do not consider alternate methods of participation restricts the kinds of conclusions they can draw regarding the potential of PERs.

Another domain that has provided a basis for the instrumental critique of PERs resides in the concept of environmental justice. However, scholars finding fault in PERs have occasionally done so using 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) have all described environmental justice exclusively in terms of distributive justice—the spreading around of 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 construal also suggests that, at best, PERs can provide a democratic vehicle with which vulnerable communities can shift environmental and public health concerns to other geographic locations.

However, a fuller account of environmental justice entails that the aim of the movement actually advocates 'that environmental bads should be eliminated at the source (procedural or process justice)' (Agyeman *et al.* 2002, p. 82). This means that environmental justice outcomes relate not only to 'environmental amenities (i.e. parks) or disamenities (i.e. incinerators)' but also to 'efforts to increase the access of all populations to environmental decision-making processes' (Pearsall and Pierce 2010, p. 570). The latter emphasis on the role of participation in reaching decisions in environmental governance has 'always been part of environmental justice discourse' (Schlosberg 2013, p. 40). However, for reasons stated below, we argue that PERs are likely to produce beneficial environmental outcomes as well.

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, p. 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, p. 230). In short, PERs offer an attractive means of empowering individuals and groups that have been historically disadvantaged in environmental governance. Empowerment figures prominently in the concept of sustainability, which we turn to 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 since the instrumental critique of PERs rests upon 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. While 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, p. 38). While participation has been thoroughly explored above, 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, pp. 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, p. 234). Yet, it is precisely the social dimension of sustainability which is often given short shrift in the literature on sustainable development (Giddings *et al.* 2002, p. 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' (WCED 1987, p. 47), which, as indicated above, may or may not result in environmental protection. The report later emphasizes the significance of empowerment, mainly in regards 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 critical theorists and green theorists alike that PERs offer little promise for advancing environmental justice. We have shown how the critical argument underappreciates the impact such rights can have in theory and practice. We have also 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. 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 which examines the effects of constitutional provisions for economic and social rights on economic and social outcomes such as Matsuura (2013), Edwards and Marin (2014), Kaletski et al. (2014), and Minkler and Prakash (2015). Matsuura (2014), for example, explores data from 157 countries from 1970-2007 to demonstrate if the constitutional right to health has an effect on population health. For countries with increasing levels of democratic governance, he 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 find no discernible relationship between having said constitutional right and higher test scores. Based on the Social and Economic Rights Fulfillment (SERF) Index (Fukuda-Parr, Lawson-Remer, and Randolph, 2015), Kaletski et al. (2014) 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 (2015) find a negative and statistically significant causal relationship between having constitutional economic and social rights provision and poverty.

Beginning with Boyd (2012), there have been a handful of quantitative studies aimed at exploring: (1) the reasons why a country might adopt constitutional environmental rights (Gellers, 2012, 2015); and (2) the relationship between constitutional environmental rights provisions and environmental (human rights) outcomes (Jeffords, 2013; Jeffords and Minkler, 2014; and Jeffords, 2015). With respect to the former, Gellers (2012) observes that regional influences fail to explain the proliferation of constitutional environmental rights among developing countries. In a global analysis, Gellers (2015) concludes 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. Jeffords (2013) finds that younger countries in earlier stages of development are more likely to include constitutional environmental rights provisions than older countries in later stages of development. Using the data from Jeffords (2013), Jeffords and Minkler (2014) find a causal link between having a constitutional environmental rights provision and environmental outcomes as measured by the Environmental Performance Index published by the Yale Center for Environmental Law and Policy (Emerson et al., 2012). Although their framework is cross-sectional, their results are robust to various controls and indicate that countries are more likely to include environmental rights provisions in their constitutions if they are younger, have a growing number of other economic and social rights, and if there is a growing number of national constitutions with environmental rights provisions. In this sense, their findings echo those of Elkins, Ginsburg, and Simmons (2013), who note that the International Bill of Human Rights – the collection of documents where most economic and social rights are derived from – has had a coordination effect on national constitution makers. Using panel data covering 190 countries from 1990-2012, Jeffords (2015) interacts the existence and a measure of the strength of the language of constitutional environmental rights provisions with their respective age to consider what effect these variables have on access to improved sanitation facilities and drinking water sources. Although there is limited evidence of a relationship with respect to sanitation – perhaps due to the lagging nature in which the United Nations has treated sanitation as a human right

relative to clean water – there is a positive and statistically significant relationship between aging constitutional environmental rights provisions and access to improved drinking water sources.

While many studies exist which examine the role of *substantive* constitutional environmental rights on various outcome measures, this is seemingly the first to consider the effect of constitutional *procedural* environmental rights on outcomes. In particular, we not only consider the effect of procedural rights, but also the value added of particular procedural rights 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

In an effort to control for reverse or simultaneous causality, the cross-sectional framework is implemented by regressing explanatory variables for country i in period t on dependent variables for country i in period $t+1$ as follows:

$$Y_{it+1} = \beta_o + \boldsymbol{X'_{it}}\boldsymbol{\alpha} + \epsilon_{it}, \quad (1)$$

where β_o is the regression intercept or conditional mean value of the dependent variable, and X is a vector of country-specific explanatory variables. The term ϵ_{it} is the typical, independently and identically distributed, normal disturbance term.

Because we expect that SERs could serve a similar role as PERs in terms of increasing access to environmental justice but are especially interested in the value-added of PERs, we build our empirical framework in steps. We first consider specifications including a dummy or indicator variable for the presence (or not) of a SER. We then consider specifications including a dummy variable for the presence (or not) of PERs. These first 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 procedural environmental right on the outcome variable while controlling for the presence (or not) of a SER. In addition to the interaction term, the latter specification also includes the two rights as separate indicator variables.

Let S be a dummy variable that takes on the value 1 if the country has a SER in its constitution, and 0 otherwise. Further define I, P, and J as dummy variables indicating the presence (or not) of a procedural environmental right to information, participation, and justice. Consider also the vector of additional explanatory variables, X, and write the first specification as follows:

$$Y_{it+1} = \beta_o + \gamma S_{it} + \boldsymbol{X'_{it}}\boldsymbol{\alpha} + \epsilon_{it}. \quad (2)$$

The second specification can be succinctly written as:

$$Y_{it+1} = \beta_o + \delta R_{it} + \boldsymbol{X'_{it}}\boldsymbol{\alpha} + \epsilon_{it}, \quad (3)$$

where R is a placeholder for any one of the three PERs discussed above. The third specification is then written as:

$$Y_{it+1} = \beta_o + \gamma S_{it} + \delta R_{it} + \boldsymbol{X'_{it}\alpha} + \epsilon_{it}. \quad (4)$$

Building on equation (4), the fourth specification is written as:

$$Y_{it+1} = \beta_o + \gamma S_{it} + \delta R_{it} + \theta S_{it} R_{it} + \boldsymbol{X'_{it}\alpha} + \epsilon_{it}. \quad (5)$$

Based on equation (5), the effect of having a PER can change depending on whether or not the constitution of a given country also has a SER. The combined effect of having a constitutional procedural environmental right is thus:

$$\delta R_{it} + \theta S_{it} R_{it}, \quad (6)$$

where, for a constitution with a SER, the effect of having a procedural environmental right is defined by the sum of the coefficient estimates of δ and θ. When the constitution does not contain a SER, the coefficient estimate of δ is interpreted as the unique effect of the procedural environmental right on Y.

Model building

Based on the discussion above, we estimate equations (2), (3), (4), and (5) recognizing that while these specifications suffer from omitted variables 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. This type of regression analysis is essentially a difference of means test or akin to a simple ANOVA.[1]

Data and primary dependent and independent variables

The primary data-set consists of observations for 214 countries as of 2009/2010. As a result of missing data either for the dependent or independent variables, the observation count across the models averages in the high 180s. The remainder of this section outlines the primary dependent and independent variables.

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

While the former three variables are considered human rights outcome indicators, the latter 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, 2014). Concurrently, however, there is a nascent literature linking constitutional environmental rights provisions to human rights outcomes (Jeffords and Minkler, 2014; Jeffords, 2015) and a related literature linking PERs to specific human rights outcomes such as sanitation and water quality (Zimmer, Winkler, and De Albuquerque, 2014; Musembi, 2015). To thus account for the possibility that SERs and/or PERs could impact human rights outcomes, environmental outcomes, or both, we consider the two types of outcomes (which are by no means all of the possible outcomes we could explore).

Based on the discussion above, we selected 2009-2010 as the two year time period for the econometric framework. Although the access to water and sanitation variables are available through 2012, data on carbon dioxide emissions was limited to 2010. Because of this, we opted to use 2009-2010 as the time period for the lagged cross-sectional analysis.

The primary independent variables are taken from Appendix A and Appendix I in May and Daly (2015). Appendix A lists all of the countries whose constitutions include SERs, while Appendix I lists all of the countries whose constitutions include any one of the three PERs to information, participation, and justice. The coding of these data is simple: denote with a "1" if the country has the right in its constitution, "0" otherwise.

Table 1 presents some summary statistics about the dependent and independent variables as of 2010. In particular, urban access to water and/or sanitation is (on average) greater than that available in rural areas. Approximately 72 countries out of the 214 have an SER, while 19, 12, and 16 have PERs to information, participation, and justice, respectively. Following up the summary statistics, Table 2 presents some simple cross-tabulations of having an SER or any one of the three PERs. For those countries with a PER to information, 13 countries also have an SER while 6 do not. There is a pretty even mix for those 12 countries with a PER to participation, and 14 of the 16 countries with a PER to justice also have a SER.

<INSERT TABLES 1 AND 2 ABOUT HERE>

Results and discussion

PER to information

The results from estimating equations (2), (3), (4), and (5) for each of the three PERs are found in Tables 3a/3b, 4a/4b, and 5a/5b. One striking result is that the percentage of the population with access to water, sanitation, and water and sanitation combined (both across 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 4.421 percentage points higher, and rural access to water is 13.44 percentage points higher. These results also hold for the specifications which control for the presence of a SER. When controlling for both rights and including the interaction term, the combined effect as measured from equation (6) yields a statistically significant positive impact on the reported access variables.

What is also interesting is that the presence of a SER is negatively related to the access variables and is at times highly statistically significant. For example, having a SER is associated with an average reduction in the percent of the rural population with access to water of 9.358 percentage points. When also accounting for the PER, the reduction is 12.20 points while the positive effect of the PER is 18.7 points, leading an overall increase in the mean reported values for countries that have both types of rights. We think this negative result is a potential side effect of omitted variables bias (or simply the fact that the distribution of countries is highly skewed towards not having a PER to information). In fact, in the unreported results mentioned in footnote 1, the negative effect is dampened when we include the additional controls and even switches to have a positive (but statistically insignificant) effect. Furthermore, Jeffords (2015) finds a positive relationship between a similar data set of environmental rights (Jeffords, 2013) and the same access to water variables, and his analysis is set within a panel framework accounting for many additional control variables.

The results tell a different story in terms of the relationship between CO2 emissions and having a SER and/or PER. The presence of an 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. 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 and the extent of climate change. This indicates the need 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. This simple analysis indicates that the two are working against each other in this context.

<INSERT TABLES 3a AND 3b ABOUT HERE>

PER to participation

The results for the PER to participation are not as exciting. The PER to participation does not have a statistically significant impact on any of the access variables or on CO2 emissions, and having a SER and a PER does lead to a similar negative effect of the SER on the access variables and CO2 emissions.

<INSERT TABLES 4a AND 4b ABOUT HERE>

PER to justice

Although there are some instances where it appears the PER to justice is positively related to the access variables, it is important to consider the combined effect stemming from equation (6). For example, within the urban access to water model, the PER to justice adds 4.242 percentage points to the average access value but the interaction term reduces the average value by 8.467 percentage points. The combined effect is thus negative, even after controlling for having a SER.

Having a SER is again negatively related to the access variables and CO2 emissions, where it appears that the combined effect of having a SER and a PER yields an overall reduction in CO2 emissions on average (see the last column of Table 5).

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 where information can spread so quickly through various means (e.g., computers and smart phones), is more of a practical matter that leads to behavioral changes than say the right to participate in environmental matters or the right to remediation from environmental damages (i.e., justice).[2]

<INSERT TABLES 5a AND 5b ABOUT HERE>

Conclusion

The empirical analysis above 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. 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, while 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 along the path to promoting environmental justice and achieving sustainable development.

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Tables

Table 1: Summary Statistics as of 2010

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Urban Access to Water	194	94.756	7.655	52.300	100
Rural Access to Water	188	82.301	20.147	8.800	100
Urban Access to Sanitation	188	79.043	24.611	18.800	100
Rural Access to Sanitation	184	65.652	33.887	3.000	100
Urban Access to Water and Sanitation	186	86.719	14.912	48.250	100
Rural Access to Water and Sanitation	181	73.660	25.656	7.550	100
Per Capita CO2 Emissions (Metric Tons)	198	4.923	6.362	0.009	40.310
Substantive Environmental Right	214	0.336	0.474	0	1
Procedural Environmental Rights					
Information	214	0.089	0.285	0	1
Participation	214	0.056	0.231	0	1
Justice	214	0.075	0.264	0	1

Table 2: Cross-Tabulations of SERs and PERs

	Has a PER to Information			Has a PER to Participation			Has a PER to Justice		
Has a SER	**No**	**Yes**	**Total**	**No**	**Yes**	**Total**	**No**	**Yes**	**Total**
No	136	6	142	135	7	142	140	2	142
Yes	59	13	72	67	5	72	58	14	72
Total	195	19	214	202	12	214	198	16	214

Table 3a: Estimations Results Within PER to Information Framework

	Urban Access to Water				Rural Access to Water				Urban Access to Sanitation				Rural Access to Sanitation			
SER	-1.582		-2.362*	-2.519*	-9.358***		-12.20***	-13.23***	-7.718**		-11.01***	-11.63***	-8.729*		-12.71**	-15.15***
	(1.187)		(1.230)	(1.345)	(3.122)		(3.190)	(3.421)	(3.846)		(3.975)	(4.295)	(5.200)		(5.505)	(5.651)
PER Information		4.421***	5.362***	4.099***		13.44***	18.70***	8.529***		16.92***	21.67***	15.56***		21.03***	26.41***	2.619
		(0.856)	(1.031)	(0.779)		(2.314)	(3.126)	(3.029)		(2.467)	(3.248)	(2.354)		(6.173)	(7.627)	(20.31)
SER * PER Information				1.836				13.88***				8.341*				32.47
				(1.631)				(4.716)				(4.807)				(21.09)
Constant	95.33***	94.35***	95.11***	95.16***	85.78***	81.09***	85.15***	85.50***	81.92***	77.51***	81.18***	81.39***	68.97***	63.71***	68.05***	68.88***
	(0.649)	(0.595)	(0.656)	(0.675)	(1.667)	(1.581)	(1.687)	(1.726)	(2.089)	(1.934)	(2.101)	(2.156)	(3.076)	(2.655)	(3.095)	(3.121)
Observations	194	194	194	194	188	188	188	188	188	188	188	188	184	184	184	184
R-squared	0.010	0.028	0.049	0.050	0.051	0.037	0.117	0.124	0.023	0.039	0.083	0.085	0.016	0.032	0.064	0.078
Adjusted R-squared	0.005	0.023	0.039	0.035	0.046	0.032	0.108	0.110	0.018	0.034	0.073	0.070	0.010	0.027	0.053	0.062

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

Table 3b: Estimations Results Within PER to Information Framework

	Urban Access to Water and Sanitation				Rural Access to Water and Sanitation				Per Capita CO2 Emissions (Metric Tons)			
SER	-4.406*		-6.465***	-6.831***	-8.682**		-12.85***	-13.56***	-2.388***		-2.668***	-2.963***
	(2.333)		(2.398)	(2.593)	(3.990)		(4.076)	(4.335)	(0.773)		(0.758)	(0.799)
PER Information		10.85***	13.61***	10.03***		20.26***	26.26***	17.25***		1.100	2.061*	0.0404
		(1.509)	(1.960)	(1.470)		(2.805)	(3.655)	(3.535)		(1.061)	(1.082)	(2.183)
SER * PER Information				4.888*				11.50**				3.108
				(2.928)				(5.576)				(2.435)
Constant	88.38***	85.73***	87.91***	88.03***	77.02***	71.87***	76.31***	76.55***	5.779***	4.818***	5.682***	5.777***
	(1.282)	(1.176)	(1.289)	(1.323)	(2.279)	(2.035)	(2.287)	(2.338)	(0.657)	(0.491)	(0.667)	(0.685)
Observations	186	186	186	186	181	181	181	181	198	198	198	198
R-squared	0.021	0.044	0.086	0.087	0.027	0.051	0.106	0.108	0.018	0.021	0.050	0.062
Adjusted R-squared	0.015	0.039	0.076	0.072	0.022	0.045	0.096	0.093	0.013	0.016	0.040	0.047

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

Table 4a: Estimation Results Within PER to Participation Framework

	Urban Access to Water			Rural Access to Water			Urban Access to Sanitation			Rural Access to Sanitation		
SER		-1.645	-1.749		-9.296***	-9.164***		-7.852**	-7.620*		-8.700*	-8.870
		(1.197)	(1.259)		(3.157)	(3.243)		(3.855)	(4.014)		(5.259)	(5.434)
PER Participation	1.765	2.007	1.098	-3.443	-1.654	-0.243	3.546	4.604	6.603	-2.149	-1.049	-2.503
	(1.592)	(1.649)	(2.677)	(7.532)	(7.360)	(11.44)	(7.309)	(7.106)	(7.660)	(11.21)	(11.30)	(18.54)
SER * PER Participation			1.849			-2.586			-4.060			2.950
			(3.240)			(14.92)			(14.29)			(22.52)
Constant	94.66***	95.25***	95.28***	82.47***	85.84***	85.79***	78.85***	81.72***	81.64***	65.77***	69.02***	69.08***
	(0.575)	(0.659)	(0.671)	(1.501)	(1.675)	(1.689)	(1.858)	(2.134)	(2.165)	(2.573)	(3.086)	(3.124)
Observations	194	194	194	188	188	188	188	188	188	184	184	184
R-squared	0.003	0.013	0.014	0.001	0.051	0.051	0.001	0.025	0.025	0.000	0.016	0.016
Adjusted R-squared	-0.003	0.003	-0.002	-0.004	0.041	0.036	-0.004	0.014	0.009	-0.005	0.005	-0.001

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

Table 4b: Estimation Results Within PER to Participation Framework

	Urban Access to Water and Sanitation			Rural Access to Water and Sanitation			Per Capita CO2 Emissions (Metric Tons)		
SER		-4.504*	-4.425*		-8.775**	-8.338**		-2.367***	-2.339***
		(2.343)	(2.446)		(4.032)	(4.167)		(0.771)	(0.813)
PER Participation	2.849	3.437	4.110	1.053	2.612	7.191	-1.140	-0.899	-0.691
	(4.161)	(4.085)	(5.140)	(8.698)	(8.434)	(13.01)	(1.181)	(1.093)	(1.838)
SER * PER Participation			-1.365			-8.382			-0.465
			(8.208)			(16.92)			(2.055)
Constant	86.57***	88.23***	88.20***	73.61***	76.92***	76.76***	4.986***	5.822***	5.812***
	(1.135)	(1.306)	(1.326)	(1.963)	(2.297)	(2.325)	(0.475)	(0.673)	(0.688)
Observations	186	186	186	181	181	181	198	198	198
R-squared	0.002	0.023	0.023	0.000	0.028	0.029	0.001	0.019	0.019
Adjusted R-squared	-0.004	0.013	0.007	-0.006	0.017	0.013	-0.004	0.009	0.004

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

Table 5a: Estimation Results Within PER to Justice Framework

	Urban Access to Water			Rural Access to Water			Urban Access to Sanitation			Rural Access to Sanitation		
SER		-1.038	-0.669		-8.272**	-7.571**		-7.714*	-6.837		-7.347	-5.343
		(1.166)	(1.193)		(3.279)	(3.393)		(4.076)	(4.227)		(5.553)	(5.675)
PER Justice	-3.542	-2.960	4.242***	-10.47*	-5.928	7.543	-4.262	-0.0238	16.82***	-11.55	-7.571	30.51***
	(2.654)	(2.683)	(0.751)	(5.681)	(5.791)	(5.149)	(6.772)	(6.980)	(2.398)	(8.931)	(9.306)	(3.213)
SER * PER Justice			-8.467***			-15.84*			-19.80**			-44.76***
			(3.112)			(8.322)			(8.278)			(10.31)
Constant	95.05***	95.37***	95.26***	83.19***	85.89***	85.66***	79.41***	81.92***	81.63***	66.66***	69.11***	68.44***
	(0.548)	(0.655)	(0.661)	(1.510)	(1.681)	(1.700)	(1.869)	(2.100)	(2.126)	(2.607)	(3.099)	(3.124)
Observations	194	194	194	188	188	188	188	188	188	184	184	184
R-squared	0.016	0.020	0.031	0.021	0.057	0.062	0.002	0.023	0.029	0.009	0.019	0.035
Adjusted R-squared	0.011	0.010	0.015	0.016	0.047	0.047	-0.003	0.013	0.013	0.004	0.008	0.019

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

Table 5b: Estimation Results Within PER to Justice Framework

	Urban Access to Water and Sanitation			Rural Access to Water and Sanitation			Per Capita CO2 Emissions (Metric Tons)		
SER		-4.140*	-3.500		-7.464*	-6.078		-2.451***	-2.080**
		(2.462)	(2.543)		(4.241)	(4.353)		(0.807)	(0.809)
PER Justice	-3.714	-1.455	10.78***	-10.69	-6.695	19.41***	-1.031	0.346	7.727***
	(4.228)	(4.351)	(1.496)	(6.976)	(7.194)	(3.641)	(1.265)	(1.171)	(1.482)
SER * PER Justice			-14.39***			-30.68***			-8.674***
			(5.097)			(8.569)			(1.768)
Constant	87.04***	88.40***	88.19***	74.61***	77.14***	76.67***	5.006***	5.774***	5.658***
	(1.134)	(1.290)	(1.305)	(1.979)	(2.299)	(2.319)	(0.482)	(0.658)	(0.665)
Observations	186	186	186	181	181	181	198	198	198
R-squared	0.005	0.021	0.030	0.014	0.032	0.046	0.001	0.019	0.031
Adjusted R-squared	-0.001	0.011	0.014	0.009	0.021	0.029	-0.004	0.008	0.016

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

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Notes

[1] In unreported results, we also considered two additional specifications to account for additional control variables. To save on space, however, we omit these results from the present paper and make them available upon request. The second specification builds on the first by incorporating three resource constraints: income, institutional, and natural. These include a measure of purchasing-power-parity adjusted GDP, the Rule of Law Index from the World Governance Indicators (Kaufmann et al., 2010), population density, and forest cover. This allows us to consider the effects of limited resources on environmental justice outcomes. The final specification builds on the second by adding proxies for sociodemographic constraints including measures of societal, political, and gender equality/inequality. These include a measure of Linguistic Diversity from Ethnologue (Lewis et al., 2015), a measure of the degree of electoral self-determination from the CIRI Database (Cingranelli et al., 2014), and the female percent of the population. The full model thus accounts for resource and sociodemographic constraints.

In addition to these specifications, we also considered a secondary econometric framework that explicitly considered the age of the constitutional environmental rights provisions. In other words, the dummy and interaction variables described above were also interacted with the country-specific age. For example, if a country created its constitution in 1990 and added the environmental rights in 1995, then the age of the constitution as of 2010 would be 20 and the age of the environmental rights provisions would be 15. It is the latter age that is interacted with the provisions unless, of course, the provision was included at the same time the constitution was written and not amended in at a later date. For the sake of space constraints, however, we do not report these results here but can make them available upon request. In short, because the income variables and some of the other controls variables have an inherent time trend associated with the age of the country and its time-path to its current level of development, the additional interaction with provision age does not have an overwhelmingly important effect in a cross-sectional analysis.

[2] As far as the robustness of the primary results, it is important to note that the main findings of the paper do not substantively change when we add the income, institutional, natural, and sociodemographic constraints. The same is true within the framework that considers the age of the environmental rights. The results are, of course, available upon request.