

Rights-based Approaches to Development in the Asia-Pacific Region: The Role of Environmental Rights

Chris Jeffords¹ and Joshua C. Gellers²

1. Introduction

Broadly speaking, the literature on environmental rights can be sorted into three categories—philosophical treatises, legal catalogues and updates, and social scientific analyses. The philosophical works have debated the merits of establishing separate human rights to the environment and rights of the environment,³ defined the physical and ontological boundaries of the environment,⁴ and specified the content of such rights.⁵ The legal catalogues and updates constitute the greatest body of work in this area, providing an extensive accounting of the prevalence of environmental rights in constitutions, jurisprudence, and legislation throughout the world⁶ and detailed reviews of their implementation across different regions.⁷ The latest development in the literature involves methodologically rigorous social scientific analyses concerning the origins and impacts of environmental rights on a globally comparative basis.⁸

This most recent wave of scholarship has resulted in several important insights. First, a majority of constitutions around the world feature provisions regarding environmental protection. Of those countries with constitutional environmental rights, most have found direct instantiation in national environmental laws and a large number have been enforced by courts.⁹ Second, countries are more likely to adopt environmental rights in their national charters when

¹ Chris Jeffords is an Associate Professor in the Department of Economics and Co-Director of the Sustainability Studies Program and Minor at the Indiana University of Pennsylvania, and Faculty Affiliate of the Economic and Social Rights Group at the Human Rights Institute (University of Connecticut).

² Joshua C. Gellers is an Associate Professor in the Department of Political Science and Public Administration at the University of North Florida, Research Fellow of the Earth System Governance Project, Honorary Fellow of the Southasia Institute of Advanced Studies, and Fulbright Scholar to Sri Lanka (2016-17).

³ Joseph L Sax, 'The Search for Environmental Rights' (1990) 6 *Journal of Land Use and Environmental Law* 93.

⁴ Markku Oksanen, Ashley Dodsworth and Selina O'Doherty, *Environmental Human Rights: A Political Theory Perspective* (Routledge 2017).

⁵ James W Nickel, 'The Human Right to a Safe Environment: Philosophical Perspectives on Its Scope and Justification' (1993) 18 *Yale Journal of International Law* 281.

⁶ James R May, 'Constituting Fundamental Environmental Rights Worldwide' (2005) 23 *Pace Environmental Law Review* 113.

⁷ Adrians Fabra Aguilar, 'Enforcing the Right to a Healthy Environment in Latin America' (1994) 3 *Review of European Community & International Environmental Law* 215; Ryan K Gravelle, 'Enforcing the Elusive: Environmental Rights in East European Constitutions' (1997) 16 *Virginia Environmental Law Journal* 633; Carl Bruch, Wole Coker and Chris VanArsdale, 'Constitutional Environmental Law: Giving Force to Fundamental Principles in Africa' (2001) 26 *Columbia Journal of Environmental Law* 131; Parvez Hassan and Azim Azfar, 'Securing Environmental Rights through Public Interest Litigation in South Asia' (2004) 22 *Virginia Environmental Law Journal* 215.

⁸ David R Boyd, *The Environmental Rights Revolution: A Global Study of Constitutions, Human Rights, and the Environment* (UBC Press 2012); Christopher Jeffords, 'On the Temporal Effects of Static Constitutional Environmental Rights Provisions on Access to Improved Sanitation Facilities and Water Sources' (2016) 7 *Journal of Human Rights and the Environment* 74; Christopher Jeffords and Lanse Minkler, 'Do Constitutions Matter? The Effects of Constitutional Environmental Rights Provisions on Environmental Outcomes' (2016) 69 *Kyklos* 294; Joshua C Gellers, *The Global Emergence of Constitutional Environmental Rights* (Routledge 2017).

⁹ Boyd (n 6).

they are future-oriented,¹⁰ have a strong international civil society presence, are more democratic, and have a poor human rights record.¹¹ Third, constitutional environmental rights are positively associated with improvements in environmental quality and outcomes related to environmental justice.¹² These quantitative studies have been supplemented by recent qualitative analyses, adding that most environmental provisions in state constitutions emerged during crisis situations¹³ and that environmental rights become effective when activated through a combination of different modes of participation.¹⁴

Importantly, the literature has identified three types of environmental rights—substantive, procedural, and derivative. Substantive environmental rights (SERs) refer to those rights that guarantee citizens an environment of a certain quality (e.g., clean, ecologically-balanced, healthy, sustainable, etc.). Procedural environmental rights (PERs) entail provisions relating to information, participation, and access to justice in environmental matters. Derivative environmental rights speak to fundamental rights such as those pertaining to dignity, health, and life that courts have determined encompass substantive environmental protections. There are approximately 91 countries with substantive environmental rights,¹⁵ 43 countries that have adopted procedural environmental rights,¹⁶ and about a dozen countries whose courts have found derivative environmental rights under existing human rights.¹⁷

2. The Asia-Pacific Region and Environmental rights

Depending on the source, the constitutions of several of the 58 Asia-Pacific countries contain SERs and/or PERs. According to Boyd's analysis,¹⁸ 16 of these countries have SERs and four have PERs. May and Daly list 14 countries with SERs and nine with PERs,¹⁹ although their categorization of PERs is a bit different. They split PERs into procedural rights to information about the status of the environment (five), participation in environmental decisions (one), and environmental justice (three). A third interpretation offered by Gellers lists 16 countries with SERs and six with PERs.²⁰

¹⁰ Sina Imhof, Jerg Gutmann and Stefan Voigt, 'The Economics of Green Constitutions' (2016) 7 *Asian Journal of Law and Economics* 305.

¹¹ Joshua C Gellers, 'Explaining the Emergence of Constitutional Environmental Rights: A Global Quantitative Analysis' (2015) 6 *Journal of Human Rights and the Environment* 75.

¹² Jeffords (n 8); Jeffords and Minkler (n 8); Joshua C Gellers and Chris Jeffords, 'Toward Environmental Democracy? Procedural Environmental Rights and Environmental Justice' (2018) 18 *Global Environmental Politics* 99.

¹³ Roderic O'Gorman, 'Environmental Constitutionalism: A Comparative Study' (2017) 6 *Transnational Environmental Law* 435.

¹⁴ Lucas G Christel and Ricardo A Gutiérrez, 'Making Rights Come Alive: Environmental Rights and Modes of Participation in Argentina' (2017) 26 *Journal of Environment & Development* 322.

¹⁵ Joshua C Gellers, 'Enviro Rights Map' <<http://envirorightsmap.org/>> accessed 3 December 2018.

¹⁶ *ibid.*

¹⁷ Erin Daly and James R May, 'Global Environmental Constitutionalism: A Rights-Based Primer for Effective Strategies' in Michael Faure (ed), *Elgar Encyclopedia of Environmental Law* (Edward Elgar 2016).

¹⁸ Boyd (n 8).

¹⁹ James R May and Erin Daly, *Global Environmental Constitutionalism* (Cambridge University Press 2015).

²⁰ For yet another categorization based on a nuanced reading of the language within each constitutional provision that mentions the natural environment, see Chris Jeffords, 'Constitutional Environmental Human Rights: A Descriptive Analysis of 142 National Constitutions,' in Lanse Minkler (ed.) *The State of Economic and Social Human Rights: A Global Overview*. Cambridge University Press (2013).

The categorization doesn't stop at SERs and PERs, however, as Boyd and Gellers have each offered additional categorizations of constitutional provisions.²¹ Boyd notes that 21 countries provide language in their respective constitutions describing how individuals within that country have a duty to respect and protect the environment, and 30 have similar language related to the government's duty to respect and protect the environment.²² Gellers further categorizes certain language as a *statement of public policy* (SPP), implying that the language of the constitution directs certain environmental matters to the realm of statutory policy and law – 19 countries have this type of language in their respective constitutions.²³ Although an exception rather than a rule, some constitutions are specific in delineating the object of environmental rights, such as the human right to clean water. Gellers finds that two constitutions (Nepal and Vietnam) have this language.²⁴ Summarizing this information by country, Table 1 provides a list of the 58 Asia-Pacific countries itemizing whether they possess the aforementioned constitutional language (“1”) or not (“0”).

3. Environmental Rights and Environmental Outcomes

Given that several countries have both a SER and PER, among other types of constitutional provisions, the question remains as to whether having said provisions is associated, in any way, with improved or positive environmental outcomes. In broader cross-country and panel studies, the empirical results suggest that having such provisions is associated with improved environmental outcomes.²⁵ These studies rely on simple to advanced quantitative methods that relate having (or not) a given type of provision to an environmental outcome, where the environmental outcome is a measure of environmental quality or lack thereof. A commonly used measure of environmental quality is the Environmental Performance Index (EPI) created and maintained by the Yale Center for Environmental Law and Policy.²⁶ The 2018 version of EPI ranks countries on 24 environmental indicators aggregated into 10 issue categories, where the index value ranges from 0-100 and a score closer to 100 implies that the country is doing a “good job” meeting its environmental policy objectives. The 24 indicators are aggregated into 10 issue categories which are then aggregated into two objective categories: Environmental Health (EH) and Ecosystem Vitality (EV). The issues that aggregate to EH are air quality, water quality, and heavy metals, and the issues that aggregate to EV are biodiversity and habitat, forestry, fisheries, climate and energy, air pollution, water resources, and agriculture.²⁷ By Asia-Pacific country, Table 2 lists the 2014 and 2018 EPI, EH, and EV scores, as well as the percent change in these values from 2014 to 2018.²⁸ The final three columns of Table 2 indicate, by country, how a given

²¹ Note that May and Daly also offer additional categorizations in the appendices to their book: State environmental duties; environmental policy directives; sustainable development, future generations, and public trust; miscellaneous constitutional environmental provisions; and the right to water. May and Daly (n 20).

²² Boyd (n 8).

²³ Gellers, ‘Enviro Rights Map’ (n 15).

²⁴ *ibid.*

²⁵ Jeffords (n 8); Jeffords and Minkler (n 8); Gellers and Jeffords (n 12).

²⁶ Available at <https://epi.envirocenter.yale.edu>.

²⁷ The research team at Yale provides a yearly update (“Technical Appendix”) outlining changes to EPI and its components, and how they deal with missing data. This is available through the download section of the main EPI website: <https://epi.envirocenter.yale.edu/>.

²⁸ We selected this five-year (2014, 2015, 2016, 2017, and 2018) time period in an effort to minimize any simultaneity issues or temporal abnormalities in the discussion of having a constitutional environmental provision and its association (or lack thereof) with improved (or not) environmental outcomes.

EPI, EH, and EV score has changed from 2014 to 2018. On average, for this set of countries, there was a 12.61% improvement in EPI scores, a 15.07% reduction in EH scores, and a 45.72% improvement in EV scores. While these changes are interesting on average and by country, there are many factors that may or may not contribute to improvements (reductions) in these scores, such as various economic, social, cultural, demographic, institutional, temporal, and spatial factors, all of which are likely important for improving environmental outcomes.

After accounting for missing EPI, EH, and EV scores, Table 3 provides a more nuanced examination of the data in Table 2. The 2018 EPI data are now segmented by whether a country has a SER, PER, or SPP. Comparing the summary statistics for those countries possessing a SER, PER, or SPP (“Yes”) to those without such provisions (“No”), the results indicate, on average, that those countries with a SER, PER to information, or PER to justice have higher EPI, EH, and EV scores compared to those countries whose constitutions do not include said provisions. The results are mixed for those countries with a PER to participation, but this is likely because there is only one country with said provision and data to compare across time. For a simple PER, not delineated by type, EPI and EV scores are higher on average, but not EH scores. This could be a symptom of the data used to calculate EH scores from the underlying indicators. Finally, those countries with a SPP have, on average, lower EPI, EH, and EV scores. This could be a result of the fact that environmental policy doesn’t happen in a vacuum, and that a combination of constitutional language supporting SERs, PERs, and SPPs is more effective at addressing environmental concerns than any one provision alone.

While the above averages are derived from a cross-section of EPI, EH, and EV data, it could be the case that having a SER, PER, or SPP could lead to dynamic changes in these scores. Table 4 illustrates the average percent change from 2014 to 2018 in EPI, EH, and EV scores for those countries with a SER, PER, SPP, and SER and PER combined. The results tell a slightly different story compared to Table 3. In particular, for those countries with a SER, there is (on average) a greater percentage change in EPI and EV scores across time periods and a smaller reduction in EH scores. The same changes hold for EPI and EV scores for those countries with a PER, but the reduction in EH scores (on average) is larger. While Table 3 indicated that those countries with a SPP had smaller (on average) EPI, EH, and EV scores, Table 4 illustrates that countries with a SPP had (on average) greater percentage increases in EPI and EV scores across the time periods, despite a larger average reduction in EH scores. The results for having a SER and PER are identical to those of having a PER because it’s the same six countries that have both (Armenia, Azerbaijan, Georgia, Kyrgyzstan, Nepal, and the Russian Federation).

4. *Policy messages*

The foregoing empirical analysis of constitutional environmental rights in the Asia-Pacific points to three policy messages for the region.

1. Given the positive association between environmental rights and measures of environmental quality, policymakers should adopt both SERs and PERs at the national level, preferably in constitutions. SPPs should also be considered, although their efficacy likely depends upon their appearance alongside SERs and PERs. The precise phrasing of these provisions should reflect each country’s unique national circumstances, and civil society should be welcomed to participate in the crafting of such rights. This initiative would strengthen domestic legal frameworks related to environmental protection and human rights, and provide citizens with a rights-based mechanism for achieving

environmental justice, supporting the achievement of Sustainable Development Goals 6 (Clean Water and Sanitation), 15 (Life on Land), and 16 (Peace, Justice and Strong Institutions). It is also important to note that the implementation of environmental rights does not occur over night, and thus policymakers should take into account the likelihood of a lag between initial adoption of environmental rights and the realization of measurable outcomes.

2. Information about environmental rights jurisprudence should be made accessible online (e.g., available in different languages) and shared widely within the region.²⁹ This would not only help judges in other jurisdictions resolve cases in light of judicial decisions rendered elsewhere in the region, but it would also result in the sharing of best practices developed in more innovative quarters of the region, such as South Asia.
3. Asia-Pacific states and UN agencies should support the implementation of environmental rights by providing technical training for judges, lawyers, and advocates; raising public awareness about environmental rights and how to access legal services; and funding public interest environmental law firms. These actors would also be wise to consider how idiosyncratic characteristics of a given country (e.g., social, economic, financial, temporal, spatial, and institutional factors) might influence the ultimate success or failure of environmental rights on the ground, and adjust resources and expectations in light of these facilitating or frustrating conditions.

²⁹ For a great example of an online platform used to catalogue best practices in the implementation of environmental rights, see the UN Special Rapporteur on Human Rights and the Environment's 'Environmental Rights Database': <http://environmentalrightsdatabase.org/>.

Table 1 – Constitutional Provisions by Asia-Pacific Country

Country	Boyd (pp. 53-57, 2012)			May and Daly (pp. 281-292, 369-378, 2015)					Gellers (2018)			
	SER	PER	Individual Duty	Government Duty	SER	PER to Information	PER to Participation	PER to Justice	SER	PER	Statement of Public Policy	Right to Water
Afghanistan	0	0	0	1	1	0	0	0	0	0	1	0
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Armenia	1	0	1	1	1	1	0	0	1	1	1	0
Australia	0	0	0	0	0	0	0	0	0	0	0	0
Azerbaijan	1	1	1	1	1	1	0	1	1	1	0	0
Bangladesh	0	0	0	1	0	0	0	0	0	0	1	0
Bhutan	0	0	1	1	0	0	0	0	0	0	0	0
Brunei Darussalam	0	0	0	0	0	0	0	0	0	0	0	0
Cambodia	0	0	0	1	0	0	0	0	0	0	1	0
China	0	0	0	1	0	0	0	0	0	0	1	0
Cook Islands	0	0	0	0	0	0	0	0	0	0	0	0
DPR Korea (NK)	0	0	0	1	0	0	0	0	0	0	0	0
Fiji	0	0	0	0	0	0	0	0	1	0	0	0
French Polynesia	0	0	0	0	0	0	0	0	0	0	0	0
Georgia	1	1	1	1	1	1	0	0	1	1	1	0
Guam	0	0	0	0	0	0	0	0	0	0	0	0
Hong Kong, China	0	0	0	0	0	0	0	0	0	0	0	0
India	0	0	1	1	0	0	0	0	0	0	0	0
Indonesia	1	0	0	1	1	0	0	0	1	0	1	0
Iran (Islamic Rep. of)	1	0	0	1	0	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	0	0	0	0	0	0
Kazakhstan	0	0	1	1	0	1	0	1	0	0	0	0
Kiribati	0	0	0	0	0	0	0	0	0	0	0	0
Kyrgyzstan	1	0	0	1	1	0	0	0	1	1	0	0
Lao PDR	0	0	1	0	0	0	0	0	0	0	0	0
Macao, China	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0
Maldives	1	0	1	1	1	0	0	0	1	0	1	0
Marshall Islands	0	0	0	0	0	0	0	0	0	0	0	0
Micronesia (F.S.)	0	0	0	0	0	0	0	0	0	0	0	0
Mongolia	1	0	1	1	1	0	0	0	1	0	1	0
Myanmar	0	0	1	1	0	0	0	0	0	0	0	0
Nauru	0	0	0	0	0	0	0	0	0	0	0	0
Nepal	1	0	0	1	1	0	0	0	1	1	1	1
New Caledonia	0	0	0	0	0	0	0	0	0	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0
Niue	0	0	0	0	0	0	0	0	0	0	0	0
Northern Mariana Islands	0	0	0	0	0	0	0	0	0	0	0	0
Pakistan	0	0	0	0	0	0	0	0	0	0	0	0
Palau	0	0	0	1	0	0	0	0	0	0	1	0
Papua New Guinea	0	0	1	0	0	0	0	0	0	0	0	0
Philippines	1	0	0	1	0	0	0	0	1	0	1	0
Republic of Korea	1	0	1	1	1	0	0	0	1	0	1	0
Russian Federation	1	1	1	1	1	1	0	1	1	1	1	0
Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Singapore	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Sri Lanka	0	0	1	1	0	0	0	0	0	0	0	0
Tajikistan	0	0	1	1	0	0	0	0	0	0	0	0
Thailand	1	1	1	1	0	0	1	0	0	0	1	0
Timor-Leste	1	0	1	1	1	0	0	0	1	0	1	0
Tonga	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	1	0	1	1	1	0	0	0	1	0	1	0
Turkmenistan	1	0	0	1	1	0	0	0	1	0	1	0
Tuvalu	0	0	0	0	0	0	0	0	0	0	0	0
Uzbekistan	0	0	1	1	0	0	0	0	0	0	0	0
Vanuatu	0	0	1	0	0	0	0	0	0	0	0	0
Viet Nam	0	0	1	1	0	0	0	0	1	0	1	1
Total	16	4	21	30	14	5	1	3	16	6	19	2

Table 2 – 2014 and 2018 EPI, EH, and EV Scores by Asia-Pacific Country

Country	2014 EPI Framework			2018 EPI Framework			Percent Change 14 to 18		
	EPI	EH	EV	EPI	EH	EV	EPI	EH	EV
Afghanistan	21.57	34.61	12.87	37.74	36.76	38.40	74.97%	6.21%	198.37%
American Samoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Armenia	61.67	74.61	53.05	62.07	56.85	65.56	0.65%	-23.80%	23.58%
Australia	82.40	99.44	71.03	74.12	97.95	58.23	-10.05%	-1.50%	-18.02%
Azerbaijan	55.47	59.37	52.87	62.33	48.55	71.52	12.37%	-18.22%	35.28%
Bangladesh	25.61	30.42	22.40	29.56	11.96	41.29	15.42%	-60.68%	84.33%
Bhutan	46.86	42.07	50.06	47.22	35.27	55.18	0.77%	-16.16%	10.23%
Brunei Darussalam	66.49	89.51	51.14	63.57	96.66	41.52	-4.39%	7.99%	-18.81%
Cambodia	35.44	42.73	30.58	43.23	39.81	45.51	21.98%	-6.83%	48.82%
China	43.00	42.73	43.19	50.74	31.72	63.42	18.00%	-25.77%	46.84%
Cook Islands	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DPR Korea (NK)	N/A	50.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiji	53.08	70.72	41.33	53.09	61.70	47.35	0.02%	-12.75%	14.57%
French Polynesia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Georgia	47.23	73.12	29.97	55.69	57.10	54.75	17.91%	-21.91%	82.68%
Guam	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hong Kong, China	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
India	31.23	33.19	29.92	30.57	9.32	44.74	-2.11%	-71.92%	49.53%
Indonesia	44.36	55.72	36.78	46.92	45.44	47.90	5.77%	-18.45%	30.23%
Iran (Islamic Rep. of)	51.08	76.12	34.39	58.16	74.01	47.59	13.86%	-2.77%	38.38%
Japan	72.35	94.66	57.48	74.69	92.99	62.48	3.23%	-1.76%	8.70%
Kazakhstan	51.07	75.40	34.85	54.56	66.70	46.46	6.83%	-11.54%	33.31%
Kiribati	55.82	51.45	58.73	55.26	48.48	59.78	-1.00%	-5.77%	1.79%
Kyrgyzstan	40.63	63.46	25.41	54.86	54.78	54.92	35.02%	-13.68%	116.14%
Lao PDR	40.37	34.49	44.29	42.94	25.15	54.80	6.37%	-27.08%	23.73%
Macao, China	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Malaysia	59.31	87.71	40.37	59.22	66.63	54.28	-0.15%	-24.03%	34.46%
Maldives	N/A	N/A	N/A	52.14	73.23	38.09	N/A	N/A	N/A
Marshall Islands	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Micronesia (F.S.)	N/A	57.94	N/A	49.80	59.88	43.07	N/A	N/A	N/A
Mongolia	44.67	55.12	37.70	57.51	61.97	54.54	28.74%	12.43%	44.67%
Myanmar	27.44	41.39	18.14	45.32	35.60	51.80	65.16%	-13.99%	185.56%
Nauru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nepal	37.00	31.67	40.55	31.44	10.54	45.38	-15.03%	-66.72%	11.91%
New Caledonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New Zealand	76.41	87.92	68.74	75.96	95.96	62.63	-0.59%	9.14%	-8.89%
Niue	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Northern Mariana Islands	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	34.58	38.78	31.79	37.50	16.80	51.30	8.44%	-56.68%	61.37%
Palau	51.96	85.17	29.82	N/A	N/A	N/A	N/A	N/A	N/A
Papua New Guinea	41.09	40.97	41.17	39.35	47.26	34.09	-4.23%	15.35%	-17.20%
Philippines	44.02	60.61	32.95	57.65	55.64	58.99	30.96%	-8.20%	79.03%
Republic of Korea	63.79	81.70	51.86	62.30	73.30	54.96	-2.34%	-10.28%	5.98%
Russian Federation	53.45	74.22	39.60	63.79	75.48	55.99	19.35%	1.70%	41.39%
Samoa	N/A	72.57	N/A	54.50	61.94	49.55	N/A	N/A	N/A
Singapore	81.78	99.44	70.01	64.23	72.14	58.96	-21.46%	-27.45%	-15.78%
Solomon Islands	31.63	46.75	21.56	43.22	49.67	38.93	36.64%	6.25%	80.57%
Sri Lanka	53.88	67.49	44.80	60.61	64.70	57.88	12.49%	-4.13%	29.20%
Tajikistan	31.34	49.89	18.97	47.85	26.26	62.24	52.68%	-47.36%	228.10%
Thailand	52.83	71.17	40.61	49.88	46.21	52.33	-5.58%	-35.07%	28.86%
Timor-Leste	39.41	44.92	35.74	49.54	51.02	48.56	25.70%	13.58%	35.87%
Tonga	61.68	75.43	52.51	62.49	62.51	62.48	1.31%	-17.13%	18.99%
Turkey	54.91	73.85	42.28	52.96	71.56	40.57	-3.55%	-3.10%	-4.04%
Turkmenistan	45.07	66.12	31.04	66.10	73.53	61.15	46.66%	11.21%	97.00%
Tuvalu	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Uzbekistan	43.23	67.68	26.92	45.88	50.67	42.69	6.13%	-25.13%	58.58%
Vanuatu	45.88	57.12	38.39	44.55	50.46	40.61	-2.90%	-11.66%	5.78%
Viet Nam	38.17	52.43	28.66	46.96	47.12	46.86	23.03%	-10.13%	63.50%
Average Value	48.55	61.82	39.63	52.68	54.35	51.58	12.61%	-15.07%	45.72%

Table 3 – Summary Statistics for the 2018 EPI Framework by Constitutional Provision

Environmental Indicator	Summary Statistics	Boyd (2012)		May and Daly (2015)				Gellers (2018)					
		SER		PER to Information		PER to Participation		PER to Justice		SPP		PER	
		No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
EPI	Count	28	16	39	5	43	1	41	3	26	18	38	6
	Average	51.24	55.21	51.79	59.69	52.75	49.88	52.13	60.23	53.92	50.90	52.31	55.03
	Standard Deviation	12.31	8.44	11.44	4.24	11.24	N/A	11.28	4.96	11.58	10.49	11.08	12.14
	Minimum	29.56	31.44	29.56	54.56	29.56	N/A	29.56	54.56	30.57	29.56	29.56	31.44
	Maximum	75.96	66.10	75.96	63.79	75.96	N/A	75.96	63.79	75.96	66.10	75.96	63.79
EH	Count	28	16	39	5	43	1	41	3	26	18	38	6
	Average	52.22	58.08	53.50	60.94	54.54	46.21	53.67	63.58	56.62	51.07	54.95	50.55
	Standard Deviation	24.75	16.68	23.16	10.36	22.36	N/A	22.59	13.73	23.72	19.80	22.44	21.57
	Minimum	9.32	10.54	9.32	48.55	9.32	N/A	9.32	48.55	9.32	10.54	9.32	10.54
	Maximum	97.95	75.48	97.95	75.48	97.95	N/A	97.95	75.48	97.95	75.48	97.95	75.48
EV	Count	28	16	39	5	43	1	41	3	26	18	38	6
	Average	50.59	53.30	50.64	58.86	51.56	52.33	51.11	57.99	52.12	50.79	50.56	58.02
	Standard Deviation	8.81	8.69	8.30	9.80	8.87	N/A	8.44	12.65	9.08	8.49	8.37	9.20
	Minimum	34.09	38.09	34.09	46.46	34.09	N/A	34.09	46.46	34.09	38.09	34.09	45.38
	Maximum	63.42	71.52	63.42	71.52	71.52	N/A	65.56	71.52	71.52	65.56	63.42	71.52

Table 4 – Percent Change in EPI, EH, and EV Scores from 2014 to 2018

	Boyd (2012)		Gellers (2018)				Boyd (2012) and Gellers (2018)	
	Has a SER (15)	Does Not (27)	Has a PER (6)	Does Not (36)	Has a SPP (18)	Does Not (24)	Has a SER and PER (6)	Does Not (36)
EPI	14.03%	7.65%	11.71%	9.63%	11.26%	8.94%	11.71%	9.63%
EH	-12.22%	-21.53%	-23.77%	-17.60%	-19.21%	-17.90%	-23.77%	-17.60%
EV	44.46%	41.02%	51.83%	40.66%	45.50%	39.81%	51.83%	40.66%