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PARIS WHEN IT SIZZLES: WHAT AGENDA 21 CAN TELL US ABOUT THE LIKELY SUCCESS OF THE PARIS AGREEMENT

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Abstract: The Paris Agreement seeks to address the problem of climate change, a pressingly urgent issue, and one that is extraordinarily difficult to tackle. A primary mitigation mechanism is the requirement that member countries report their nationally determined contributions ("NDCs") goals and provide metrics for measuring progress in reducing greenhouse gas emissions. This is a "bottom-up" mechanism that does not bind parties to particular emissions targets, but acts to shift party behavior by making progress transparent. To predict the potential effectiveness of this mechanism, this Comment investigates the effectiveness of a similar mechanism contained in Agenda 21, a plan of action for sustainable development adopted in 1992.

Agenda 21 initially appeared to be effective. Similarly, the initial reporting by countries pursuant to the Paris Agreement NDC requirement indicates that it is similarly procedurally effective. However, Agenda 21 has failed to meet its goal of solving the problems of poverty and environmental degradation. A more successful outcome for the Paris Agreement may rest on how it differs from Agenda 21, including its more legally obligatory nature, its more focused goal, and its NDC ambition "ratcheting" mechanism.

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Some things are so big you don't see them, or you don't want to think about them, or you almost can't think about them. Climate change is one of those things. It's impossible to see the whole, because it's everything.[1]

The entire world has to work together to solve global warming.[2]

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[1] Rebecca Solnit, *Bigger Than That: (The Difficulty of) Looking at Climate Change*, TOMDISPATCH.COM (Oct. 6, 2013), http://www.tomdispatch.com/blog/175756/tomgram%3A_rebecca_solnit,_the_age_of_inhuman_scale.

[2] ROY SCRANTON, LEARNING TO DIE IN THE ANTHROPOCENE 53 (2015). Scranton is fairly pessimistic regarding the potential to avoid the worst of climate change. He suggests that the biggest barrier to even adequate action is the fact that "carbon powers the world's political machinery and shapes our current form of collective life . . . without . . . infrastructures built and sustained with carbon, there wouldn't be any global civilization to try to save."

I. INTRODUCTION

Mexico City is sinking,[3] Louisiana, Texas and Puerto Rico are drowning,[4] Portugal is afire,[5] and Kirabati is vanishing.[6] Across the globe, floods, droughts, heat waves, and wildfires are increasing in intensity. Rates of food and water shortages, epidemics, and episodes of social instability are climbing in the wake of the changing weather patterns. All of these impacts will accelerate as global mean atmospheric temperatures continue to rise. As French President Emmanuel Macron recently told global leaders, "[t]he fight against climate change is by far the most significant struggle of our times."[7]

Scientists in the 19th century first posited that the accumulation of emissions in the atmosphere from industrialization might impact global climate.[8] By the 1960s, scientists knew these impacts would be dangerous and warned governments of climate change's possible catastrophic effects.[9]

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[3] *See, e.g.*, Michael Kimmelman, *Mexico City, Parched and Sinking, Faces a Water Crisis*, N.Y. TIMES (Feb. 17, 2017), https://www.nytimes.com/interactive/2017/02/17/world/americas/mexico-city-sinking.html?_r=0 (describing the impact of climate change on water demand in Mexico City, where drilling for water is causing the lava bed earth beneath the city to weaken and sink).

[4] *See, e.g.*, Christopher Flavelle, *Hurricane Maria May be a Preview of Climate Change Fueled Migration in America*, BLOOMBERG (Sept. 27, 2017), https://www.bloomberg.com /news/articles/2017-09-27/hurricane-maria-may-be-u-s-preview-of-climate-fueled-migration (indicating that the damage of Hurricane Maria, the intensity of which was exacerbated by climate change, is likely to result in sharp increases in emigration off the island of Puerto Rico); Henry Fountain, *Scientists See Push From Climate Change in Louisiana Flooding*, N.Y. TIMES (Sept. 7, 2016), https://www.nytimes.com/2016/09/08/science/global-warming-louisiana-flooding.html (discussing the relationship between climate change and the increasing rate of 1000 year storms); Scott Waldman, *Global Warming Tied to Hurricane Harvey*, SCI. AM. (Dec. 14, 2017), https://www.scientificamerican.com/article/global-warming-tied-to-hurricane-harvey/ (identifying climate changes as responsible for increasing the power of Hurricane Harvey); *Hurricane Maria Updates: In Puerto Rico, the Storm 'Destroyed Us*,*'* N.Y. TIMES (Sept. 21, 2017), https://www.nytimes.com/2017/09/21/us/hurricane-maria-puerto-rico.html (describing the devastation of Hurricane Maria in Puerto Rico).

[5] *See, e.g.*, Damian Carrington, *Europe's extreme June heat clearly linked to climate change, research shows*, GUARDIAN (June 30, 2017), https://www.theguardian.com/environment/2017/jun/30/europes-extreme-june-heat-clearly-linked-to-climate-change-research-shows (identifying the link between climate change and excessive summer heat in Europe, along with resulting disasters such as the forest fires in Portugal).

[6] *See, e.g.*, Mike Ives, *A Remote Pacific Nation, Threatened by Rising Seas*, N.Y. TIMES (July 2, 2016), https://www.nytimes.com/2016/07/03/world/asia/climate-change-kiribati.html (describing the likely loss of most if not all of the territory of Kirabati to rising seas resulting from climate change).

[7] Damian Carrington, *Climate change will determine humanity's destiny, says Angela Merkel*, GUARDIAN (Nov. 15, 2017), https://www.theguardian.com/environment/2017/nov/15/climate-change-will-determine-humanitys-destiny-says-angela-merkel (quoting leaders at the Conference of the Parties in Bonn calling for unified action on climate change).

[8] *See, e.g.*, Svante Arrenhius, *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground*, 41 PHIL. MAG. & J. OF SCI. 237 (1896) (exploring the potential effect of increasing CO_2 and its impact on radiation on the energy balance of earth's atmosphere and global temperature).

[9] *E.g.*, Dana Nuccitelli, *Scientists warned the US President about global warming 50 years ago today*, GUARDIAN (Nov. 5, 2015), https://www.theguardian.com/environment/climate-consensus-97-per-cent/2015/

Yet now, more than fifty years later, global emissions continue to rise and the mean atmospheric temperature creeps ever upward.[10] The enormity of the risk, the barriers to a solution, and the sheer complexity of the problem have, in part, hindered efforts to address the activities that cause climate change. As the Kyoto Protocol, the preceding climate agreement, indicates, creation of a treaty that is unpalatable to certain parties creates the risk that the targeted problem will fail to be addressed, even despite the inclusion of enforcement mechanisms for these targets.[11] This delay means dangerous anthropogenic climate change is now a reality instead of a theoretical possibility. Thus, governments and intergovernmental agencies now include strategies to respond to the impacts of climate change—adaptation—in their policy approaches. Climate change impacts that occur in the present require immediate responses.[12]

The Paris Agreement is the most recent treaty[13] arising under the United Nations Framework Convention on Climate Change ("UNFCCC") of 1992.[14] When the Paris Agreement was finalized in 2015 it was hailed as a landmark in climate change negotiations because 195 parties participated—nearly all

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nov/05/scientists-warned-the-president-about-global-warming-50-years-ago-today (U.S. President Johnson was warned in 1965).

[10] RAJENDRA K. PACHAURI ET AL., IPCC, CLIMATE CHANGE 2014 SYNTHESIS REPORT 2 (Core Writing Team et al. eds., 2014), http://www.ipcc.ch/report/ar5/syr/ (stating that "[h]uman influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems."); *see also* DONALD J. WUEBBLES ET AL., EXECUTIVE SUMMARY, CLIMATE SCIENCE SPECIAL REP: FOURTH NAT'L CLIMATE ASSESSMENT (Donald J. Wuebbles et al. eds., 2017), https://science2017.globalchange.gov/chapter/executive-summary/ (identifying that climate change is already having extensive impacts that are likely to grow).

[11] Kyoto Protocol to the United Nations Framework Convention on Climate Change, art. 2, Dec. 11, 1997, 2303 U.N.T.S. 148 [hereinafter Kyoto Protocol]. The Kyoto Protocol is still in force. *See* DANIEL BODANSKY, JUTTA BRUNNÉE & LAVANYA RAJAMANI, INT'L CLIMATE CHANGE L. 108 (2017).

[12] *See* BODANSKY ET AL., *supra* note 11, at 2 (2017); *Climate Change Adaptation Resource Page*, U. S. ENVTL. PROTECTION AGENCY, https://www.epa.gov/arc-x (last visited Feb. 25, 2018).

[13] The Paris Agreement is a treaty under international law. *See* Vienna Convention on the Law of Treaties, art. 2(a), 23 May 1969, 1155 U.N.T.S. 331 [hereinafter VCLT]. While there is some debate in the U.S. as to whether it is a treaty for domestic purposes, the administration of President Barack Obama as well as a number of commentators claim that it is an Executive Agreement and not subject to the "advice and consent" requirement under the U.S. Constitution. *See*, U.S. CONST. art II, § 2, cl. 2; Daniel Bodansky, *The Legal Character of the Paris Agreement*, 25 REV. OF EUR., COMP. & INT'L ENVTL. L., 142, 143 (2016) (noting that the U.S., under its own Constitution, defines treaties more narrowly domestically than it does under the VLCT and international law). *But see* JANE A. LEGGETT AND RICHARD K. LATTANZIO, CONG. RESEARCH SERVICE, CLIMATE CHANGE: FREQUENTLY ASKED QUESTIONS ABOUT THE 2015 PARIS AGREEMENT (2016).

[14] Paris Agreement regarding the United Nations Framework Convention on Climate Change, *opened for signature* Apr. 22, 2016, T.I.A.S 16-1104 [hereinafter Paris Agreement]; United Nations Framework Convention on Climate Change, Mar. 21, 1994, 1771 U.N.T.S. 107 [hereinafter UNFCCC].

the nations of the world.[15] It was preceded by the 1997 Kyoto Protocol, the first treaty enacted by the UNFCCC.[16] The Paris Agreement is to some extent a response to the Kyoto Protocol because it does not impose binding emissions targets upon the parties. This characteristic served to increase participation, particularly with respect to reluctant parties such as the United States.[17] Instead, the legal structure of the Paris Agreement's central binding obligation involves reporting and transparency. Parties are required to submit nationally determined contributions ("NDCs") identifying how they will work to meet the ultimate objective of mitigating climate change.[18] The NDCs themselves are not binding, but are publicly available. Further, once they are submitted, greenhouse gases contributions, the Cs of NDCs, can only be adjusted downward, thus increasing the ambition of the commitment to emission reduction over time. Thus, the NDC mechanism attempts to spark a "ratcheting" upward of ambition, reinforced through transparency and ongoing cooperative discussions, ultimately resulting in a global decrease in emissions.

This NDC mechanism is a "bottom-up" legal obligation because the target is identified by the nations themselves, as opposed to a top-down mechanism, such as that found in the Kyoto Protocol, where the agreement imposed the target. Since each country identifies what they consider reasonably achievable NDC targets with the Paris Agreement, all parties, developed and developing, can be covered by a single mechanism that is still responsive to their different histories and current circumstances.[19] In contrast

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[15] Coral Davenport, *Nations Approve Landmark Climate Accord in Paris* (N.Y. TIMES), Dec. 12, 2015, https://www.nytimes.com/2015/12/13/world/europe/climate-change-accord-paris.html. As of November 2017, the final two holdouts, are Syria and Nicaragua, and the President of the United States intends to withdraw. *See* Lisa Friedman, *Syria Joins Paris Climate Accord, Leaving Only U.S. Opposed*, N.Y. TIMES (Nov. 7, 2017), https://www.nytimes.com/2017/11/07/climate/syria-joins-paris-agreement.html?_r=0.

[16] Kyoto Protocol, *supra* note 11.

[17] Suzanne Goldenberg, *How US negotiators ensured landmark Paris climate deal was Republican-proof*, GUARDIAN (Dec. 13, 2015), https://www.theguardian.com/us-news/2015/dec/13/climate-change-paris-deal-cop21-obama-administration-congress-republicans-environment (describing strategic positions taken by the United States during negotiations). Under the Clinton administration, the U.S. initially signed onto the Kyoto Protocol in 1997. However, the Senate refused to ratify it and the George W. Bush administration pulled out in 2001. *See* Julian Borger, *Bush kills global warming treaty*, GUARDIAN (Mar. 29, 2001), https://www.theguardian.com/environment/2001/mar/29/globalwarming.usnews.

[18] Bodansky, *supra* note 13, at 146. The Agreement does not only strive for mitigation. It is the first of the international instruments to incorporate adaptation, loss, and damage to the climate regime. *Id*. at 147.

[19] Robinson Meyer, *A Reader's Guide to the Paris Agreement*, ATLANTIC (Dec. 16, 2015), https://www.theatlantic.com/science/archive/2015/12/a-readers-guide-to-the-paris-agreement/420345/.

to this common but differentiated approach to climate change, the Kyoto Protocol required only developed countries to cut emissions.[20]

The negotiations leading up to the Paris Agreement aimed to ensure the treaty would reach nations not party to the Kyoto Agreement, such as the United States and China.[21] Given the reluctance of several parties to submit to substantively binding emissions targets, the Paris Agreement instead uses procedural transparency and mutual accountability to drive compliance through the NDC reporting requirements.[22] The NDCs fulfilled the need for a cooperative mechanism because the determination of compliant national activities is defined by the parties themselves and, in reporting its NDC, a party is subject to political and other forms of pressure from member nations. Since these NDCs are not fixed, it allows for a dynamic response to climate change issues—party goals can respond to changing information and technology.

The bottom-up transparent NDC mechanism of the Paris Agreement echoes the approach of an earlier environmental plan of action, Agenda 21. Agenda 21 was one of the several agreements produced by world parties at the third Earth Summit, the United Nations Conference on the Environment and Development in Rio de Janeiro ("Rio Conference").[23] A primary focus of the Rio Conference was sustainable development, and Agenda 21 was developed as a roadmap for moving towards global sustainable development.[24] As a "plan of action," Agenda 21 occupies a murky area between treaty and nontreaty.[25] It is not a treaty and is not governed by the Vienna Convention on the Law of Treaties. Similarly, its strongest legal language is "should," rather than "shall," indicating recommendation rather

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[20] Kyoto Protocol, *supra* note 11 (including an Annex listing the countries bound to reduce emissions; in other words, "Annex countries.").

[21] *Id*.

[22] Bodansky, *supra* note 13, at 146 (describing the tension between nations over binding NDCs and the agreed upon strong procedural requirements).

[23] *U. N. Conference on Environment and Development (1992)*, WORLD CONF. (May 23, 1997), http://www.un.org/geninfo/bp/enviro.html. Agreements adopted at the conference include Agenda 21, the UNFCCC, the Rio Declaration on Environment and Development, the Statement of Forest Principles, and the United Nations Convention on Biological Diversity.

[24] UN Conference on Environment and Development, *Agenda 21,* Preamble UN Doc. A/CONF.151/26/Rev.1 (Vol. I) (Aug. 13, 1992) [hereinafter *Agenda 21*].

[25] The Paris Agreement, in contrast, is a treaty under the Vienna Convention for the Law of Treaties: "'Treaty' means an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation." VCLT, *supra* note 13, at art. 2(a).

than obligation.[26] Agenda 21 is in the lineage of general international environmental agreements and includes some language regarding climate change. However, Agenda 21 does not directly target emissions reductions and is not part of the family of treaties that includes the UNFCCC, the Kyoto Protocol, and the Paris Agreement.

However, intriguingly, Agenda 21 includes language indicating that states should review their decision-making, "should adopt a national [sustainable development] strategy," or NSDS, to further the goal of sustainability, and "could adopt" indicators of whether this goal has been reached.[27] It also includes reporting and transparency goals.[28] These actions parallel the Paris Agreement's NDC and reporting mechanisms. Additionally, they provide a unique opportunity for analyzing the potential for these bottom-up transparency mechanisms to increase the effectiveness of an agreement.[29]

This Comment uses these parallels to investigate the likely effectiveness of the Paris Agreement. Part II describes the problem of climate change and identifies the difficulties for the international community in attacking global commons issues and "super wicked problems."[30] Part III introduces Agenda 21, describes its structure, and explores national implementation through the ten-year reports submitted by three countries: India, the United States, and Zambia. It then analyzes the effectiveness of Agenda 21 through legal, behavioral, and problem-solving lenses based upon the analytical categories developed by Daniel Bodansky.[31] Bodansky suggests that the more parties comply with the terms of the agreement, the more legally effective an agreement is.[32] When parties change their normative behavior in light of the agreement a behaviorally effective agreement arises.[33] An agreement that shows problem-solving effectiveness essentially "solves the problem" that drove its development in the first place.[34] Part IV introduces the Paris Agreement by first situating it within the international legal

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[26] Bodansky, *supra* note 13, at 145 (identifying "should" as recommending behavior).

[27] *Agenda 21, supra* note 24, at ¶¶ 8.3, 8.6, and 8.7.

[28] *Id.* at ¶ 38.

[29] Paris Agreement, *supra* note 14, at art. 8, 38.

[30] A "wicked problem" is defined as a policy problem that "defies resolution because of the enormous interdependencies, uncertainties, circularities, and conflicting stakeholders implicated by any effort to develop a solution." Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153, 1159. A "super wicked problem," therefore, is one with these problematic features plus additional exacerbating attributes.

[31] DANIEL BODANSKY, THE ART & CRAFT OF INTERNATIONAL ENVIRONMENTAL LAW 253–55 (2011).

[32] *Id*.

[33] *Id*.

[34] *Id*.

framework for addressing climate change and then explores the NDC and reporting mechanisms. Finally, Part V, uses the analysis of Agenda 21's legal, behavioral, and problem-solving effectiveness to explore the likelihood of success of the Paris Agreement.

Already, a majority of parties have submitted NDCs in compliance with the legal obligation of the Paris Agreement.[35] A large proportion of parties to Agenda 21 similarly responded to the reporting recommendations by submitting reports. This indicates both agreements are legally effective.[36] However, it is too early in the life of the Paris Agreement to know whether or not it will change behavior. The most obvious indication of behavioral effectiveness will be if parties actually meet their NDCs. Currently, reports are mixed as to whether they will. Parties to Agenda 21 only moderately appeared to change behavior as a response to Agenda 21's reporting recommendations. However, the targets of Agenda 21 were far less clear. Thus, the Paris Agreement, because of the clarity of its goal, may see higher behavioral effectiveness than Agenda 21.

Even if the Paris Agreement demonstrates legal and behavioral effectiveness, it may still fail to meet the declared temperature target of halting the mean global temperature increase at 1.5°C, or at least "well below" 2°C by the end of the century, let alone achieve the "ultimate objective" of the UNFCCC to "prevent dangerous anthropogenic interference with the climate system.[37] For Agenda 21, early compliance with reporting aspects did not predict ultimate success. Agenda 21 did not eradicate poverty or the environmental degradation arising from development, and therefore, it was not broadly effective from a problem-solving point of view.[38] Currently, if

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[35] UNFCCC, NDC Registry (Interim), http://www4.unfccc.int/ndcregistry/Pages/Home.aspx (last visited Dec. 17, 2017).

[36] BODANSKY, *supra* note 31, at 253.

[37] The Paris Agreement aspires to keep global temperature increase from preindustrial times to the end of the 21st century at or below 1.5°C. Paris Agreement, *supra* note 13, at art 2. The target of 1.5°C is a shift downward from the previous 2°C target and is a response to a consensus among the negotiating parties that 1.5 °C increase represents the temperature "tipping-point" above which important climatic variables will shift outside of the range experienced during human evolution. Adam Vaughn, *Paris climate deal: key points at a glance,* GUARDIAN (Dec. 12, 2015), https://www.theguardian.com/environment/2015/dec/12/paris-climate-deal-key-points. Currently, scientists generally consider a 2°C increase to be dangerously high; however, there is disagreement about whether 1.5 °C is "safe" or is itself too high. *Compare* Hans Joachim Schellnhuber et al., *Why the right climate target was agreed in Paris*, 6 NATURE CLIMATE CHANGE, 649, 650–51 to James Hansen et al., *Assessing "Dangerous Climate Change:" Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, 8 PLoS ONE 1, 15 (Dec. 3, 2013), http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0081648&type=printableHansen.

[38] BODANSKY, *supra* note 31, at 253.

every party to the Paris Agreement met its NDC, the planet would still see a mean global temperature increase of 3.2°C by the end of the century, breaking through the 1.5–2.0°C cap articulated in the Paris Agreement, and more than tripling the 1°C maximum increase many scientists conclude is necessary to prevent catastrophe.[39] The failure of Agenda 21, despite similar initial legal compliance, raises concerns that the Paris Agreement may similarly fail to successfully address the broad problem it seeks to solve.

Given the differences between Agenda 21 and the Paris Agreement, however, there are a few reasons for hope. The results of Agenda 21 indicate that a pure bottom-up agreement is insufficient to force adjustments in behavior. However, the Paris Agreement involves more transparency, stronger standardization, more robust institutional structures at the international level,[40] and a clear impending crisis. These factors may be sufficient to provide the added push needed to result in behavioral effectiveness and increasing ambition. Furthermore, climate change has a known solution, reduce the mean atmospheric concentration of greenhouse gases, whereas the solutions to poverty and environmental degradation are subject to dispute. Finally, even if parties to the Paris Agreement fail to cap the global mean temperature increase at 1.5°C over the next 100 years, any reduction from the 4°C plus increase projected by "business-as-usual" policies may be beneficial.[41]

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[39] Paris Agreement, *supra* note 14, at art. 2; Hansen et al., supra note 37, at 15 (noting that a 1°C average maximum increase will maintain some sea ice, minimizing the worst potential impacts of warming while a 2°C trajectory is "so dangerous" that it "would be foolhardy"); *see, e.g.*, Umair Irfan, *Climate Pledges Will Fall Short of Needed 2 Degree C Limit*, SCI. AM. (Nov. 3, 2016), https://www.scientificamerican.com/article/climate-pledges-will-fall-short-of-needed-2-degree-c-limit/ (calculating the projected temperature increase resulting if all current NDC targets are met); CLIMATE ACTION TRACKER, http://climateactiontracker.org/ (last visited Feb. 25, 2017) (identifying NDCs, calculating impacts and tracking each country's progress).

[40] While the analysis is beyond the scope of this paper, it is possible that the dedicated secretariat and regular Conferences of the Parties embedded in the climate treaty regime will support greater effectiveness of the Paris Agreement than resulted via the Commission of Sustainable Development's actions in aid of Agenda 21. For descriptions of the institutional framework for the UNFCCC and Paris Agreement *see, e.g.*, UN Climate Change, Background on the UNFCCC: The international response to climate change, http://unfccc.int/essential_background/items/6031.php (last visited Feb. 3, 2018). In contrast, international institutional support for Agenda 21 flows to the Commission on Sustainable Development, as called for in Chapter 38 of the plan. *Agenda 21*, *supra* note 24, at Chapter 38.

[41] Press Release, World Bank, New Report Examines Risks of 4 Degree Hotter World by End of Century (Nov. 18, 2012), http://www.worldbank.org/en/news/press-release/2012/11/18/new-report-examines-risks-of-degree-hotter-world-by-end-of-century (summarizing predicted impacts of a 4°C mean global temperature increase by the end of the century). Once positive feedback loops are triggered at elevated mean atmospheric temperatures, however, they may render any benefits from a slight reduction in global temperature increase (from a projected 4 to an actual 3.5°C) negligible. *See, e.g.*, Hansen et al., *supra* note 37, at 15 (indicating that mean atmospheric temperature increases higher than 1°C risk catastrophic positive feedback loops).

II. CLIMATE CHANGE: ITS IMPACTS AND THE LEGAL STRUGGLE TO ADDRESS IT

A. Climate Change and Its Effects on Natural and Social Systems

Climate change was initially called global warming because it refers to the climatic effects of an increasing global mean temperature. This temperature increase results from a rise in the concentration of greenhouse gases, such as CO_2, CH_4, and N_2O, in the atmosphere.[42] If not taken up by carbon sinks in plants, soil and the ocean, these gases, which are emitted in mass by anthropogenic industrial activities, interfere with the energy balance of the earth by trapping heat and increasing mean global surface temperature.[43] As global mean temperature increases, it also triggers positive feedback loops through thawing permafrost and subsequent methane release, and a reduction in albedo across the earth's surface, that, in turn, accelerate the temperature increase.[44] This increase in global mean temperature is accompanied by increasing ocean acidification as a result of a rise in the uptake of CO_2 by the sea.[45] Finally, the rising temperature threatens to interrupt the oceanic circulatory systems that maintain weather patterns across the globe.[46]

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[42] *Fact sheet: Climate change science—the status of climate change science today*, UNFCCC (Feb. 2011), https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_science.pdf (last visited Nov. 23, 2017) (summarizing climate change causes and impacts). Here, however, this Article uses climate change to refer to the currently occurring change in climate system arising as a result of human activities.

[43] *See, e.g.*, SUSAN SOLOMAN ET AL., TECHNICAL SUMMARY, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REP. OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Susan Soloman et al. eds, 2007).

[44] Torben R. Christensen et al., *Thawing sub-arctic permafrost: Effects on vegetation and methane emissions*, 31 GEOPHYSICAL RES. LETTERS 1 (2004); James Hansen et al., *Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2°C global warming could be dangerous*, 16 ATMOSPHERIC CHEMISTRY & PHYSICS 3761, 3762 (2016); *What Are Carbon Sinks*?, FERN, http://www.fern.org/campaign/forests-and-climate/what-are-carbon-sinks (last visited Feb. 25, 2018) (stating that a "carbon sink is anything that absorbs more carbon than it releases as carbon dioxide."); *Permafrost*, NAT'L GEOGRAPHIC, https://www.nationalgeographic.org/encyclopedia/permafrost/ (last visited Feb. 14, 2018) (stating that "[p]ermafrost is a permanently frozen layer below the Earths surface. It consists of soil, gravel, and sand, usually bound together by ice."); *Thermodynamics: Albedo*, NAT'L SNOW AND ICE DATA CENTER, https://nsidc.org/cryosphere/seaice/processes/albedo.html (last visited Feb. 14, 2018) ("Albedo is a non-dimensional, unitless quantity that indicates how well a surface reflects solar energy. Albedo [] varies between 0 and 1. Albedo commonly refers to the "whiteness" of a surface, with 0 meaning black and 1 meaning white.").

[45] *Ocean Acidification*, NOAA, https://www.pmel.noaa.gov/co2/story/Ocean+Acidification (last visited Dec. 19, 2017).

[46] *See, e.g.*, Chelsea Harvey, *Scientists say the global ocean circulation may be more vulnerable to shutdown than we thought*, WASH. POST (Jan. 1, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/01/04/scientists-say-the-global-ocean-circulation-may-be-more-vulnerable-to-shutdown-than-we-thought/?utm_term=.2957bd9e2a3d.

The greenhouse gases that cause climate change remain in the atmosphere for decades, or even centuries.[47] Thus, the current mean atmospheric concentration of greenhouse gases, at about 400 parts per million ("ppm"), is the result of the cumulative effect of emissions released throughout the industrial period, starting at about 1750.[48] This increase from pre-1750 levels of 280 ppm has resulted in an approximately 1.2°C rise in the global mean temperature as of 2016.[49] Furthermore, some greenhouse gases still have impacts thousands of years after they leave the atmosphere.[50] This means halting emissions entirely today would still not be sufficient to prevent some level of climate change. It also means the longer the world waits to address the issue, the harder it will be to solve.[51]

Part of the problem is that governments respond with vigor only to those threats that are tangible, such as an attack by hostile agents. Climate change is not tangible as a unitary phenomenon. It is instead a presence, a haunting, something interwoven throughout experience.[52] A hotter mean global temperature does not mean that everything is hotter all the time; snow still forms and people still feel cold.[53] Instead, it creates extremes of temperature on both ends of the spectrum, disrupts hydrogeological systems, and contributes to more frequent and intense weather events (hurricane, drought, and flooding) and other disasters, such as massive forest fires.[54]

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[47] Duncan Clark & Carbon Brief, *How long do greenhouse gases stay in the air?* GUARDIAN (Jan. 16, 2012), https://www.theguardian.com/environment/2012/jan/16/greenhouse-gases-remain-air (last visited Dec. 12, 2017).

[48] Press Release, World Meteorological Org., Globally Averaged CO_2 Levels Reach 400 parts per million in 2015 (Oct. 24, 2016), https://public.wmo.int/en/media/press-release/globally-averaged-co2-levels-reach-400-parts-million-2015.

[49] WORLD METEOROLOGICAL ORG., WMO STATEMENT ON THE STATE OF THE GLOBAL CLIMATE IN 2016 5 (2017), https://library.wmo.int/opac/doc_num.php?explnum_id=3414 (estimating that the mean global temperature in 2016 was 1.1°C higher than preindustrial times).

[50] Justin Gillis, *Carbon in Atmosphere is Rising Even as Emissions Stabilize*, N.Y. TIMES (June 26, 2017), https://www.nytimes.com/2017/06/26/climate/carbon-in-atmosphere-is-rising-even-as-emissions-stabilize.html?_r=0.

[51] Eric Holthaus, *The Point of No Return: Climate Change Nightmares Are Already Here*, ROLLING STONE (Aug. 5, 2015), http://www.rollingstone.com/politics/news/the-point-of-no-return-climate-change-nightmares-are-already-here-20150805 (discussing current impacts of climate change and comparing them to predictions); Oliver Milman, *Planet has just 5% chance of reaching Paris climate goal, study says*, GUARDIAN (July 31, 2017), https://www.theguardian.com/environment/2017/jul/31/paris-climate-deal-2c-warming-study (indicating that the world currently has a 5% chance of reaching Paris targets).

[52] *Apocalypse Now, Jeff van der Meer*, ON THE MEDIA (July 6, 2017), https://www.wnyc.org/story/on-the-media-2017-07-07/.

[53] Philip Bump, *Jim Inhofe's snowball has disproven climate change once and for all*, WASH. POST (Feb. 26, 2015), https://www.washingtonpost.com/news/the-fix/wp/2015/02/26/jim-inhofes-snowball-has-disproven-climate-change-once-and-for-all/?utm_term=.9c8658f26e10 (describing United States Sen. Inhofe's attempt to use a snowball's existence as proof that climate change is not real).

[54] *See, e.g.*, Hansen et al., *supra* note 37, at 6–9 (describing impacts of climate change).

Further, it results in increased acidification of the world's oceans. It even influences the earth's crust, potentially leading to more frequent earthquakes and tsunamis.[55] The risk to the world's population from these global shifts in weather range from temperature-related mortality, extraordinary disruption from massive storms, and the loss of homeland.[56]

These physical shifts disrupt biological systems across the planet. Species change distribution, abundance, and behavior in response to changes in temperature.[57] These disruptions reinforce the current mass extinction event, resulting in an even higher loss of species than would be anticipated in the absence of climate change.[58] In concert with weather events, the increasing acidity of the ocean threatens coral and other taxa by preventing

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[55] Bill McGuire, *How climate change triggers earthquakes, tsunamis and volcanos*, GUARDIAN (Oct. 16, 2016), https://www.theguardian.com/world/2016/oct/16/climate-change-triggers-earthquakes-tsunamis-volcanoes.

[56] *See, e.g.*, DAVID W. ORR, DOWN TO THE WIRE: CONFRONTING CLIMATE COLLAPSE 74 (Oxford University Press 2009) (stating that "[t]he effects of our present use of coal, oil, and natural gas will kill into the far future, but we cannot know exactly who, where, or how they will die. We do know, however, that the number will be very large and that they will perish in storms, or heat waves, or of strange diseases, or in violence amplified by famine, or in any of a thousand other ways."); Kirk R. Smith et al., 2014: *Human health: impacts, adaptation, and co-benefit*, *in* IMPACTS, ADAPTATION, AND VULNERABILITY. PART A: GLOBAL AND SECTORAL ASPECTS CONTRIBUTION OF WORKING GROUP II TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 709, 716–33 (C.B. Field et al. eds., 2014) (discussing extensively impacts of climate change on human health and welfare); Samantha Andoot & Susan Pachelo, *Global Climate Change and Children's Health*, 136 PEDIATRICS 992, 993–94 (2015) (identifying negatives impacts on children of climate change); Ives, *supra* note 6; Anthony J. McMichael, *Globalization, Climate Change, and Human Health.* 368 NEW ENG. J. MED. 1335, 1340 (2013) (enumerating health impacts of warming climate ranging from increased disease to respiratory ailments).

[57] Jorge García Molinos et al., *Climate velocity and the future global redistribution of marine biodiversity*, 6 NATURE CLIMATE CHANGE 83, 85–87 (2015) (modeling extinction and massive changes in community composition of marine systems predicted to result from climate change); J. F. MacLaughlin et al., *Climate change hastens population extinctions*, 99 PROC. OF THE NAT'L ACAD. OF SCI., 6070, 6074 (2002) (discussing interactions of climate-change-caused factors that lead to population, and subsequently species, extinction); W. Thuiller et al., *Consequences of climate change on the tree of life in Europe*, 470 NATURE 531, 534 (2011) (predicting a decrease in biodiversity in Europe as a result of changes in distributions resulting from climate change); Bob B. M. Wong & Ulrika Candolin, *Behavioral responses to changing environments*, 26 BEHAV. ECOLOGY 665, 667–69 (2015) (discussing behavioral and distribution currently occurring as a result of climate change and identifying the potential for change in the future).

[58] Gerardo Ceballos et al., *Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines*, 114 PROC. OF THE NAT'L ACAD. OF SCI., E6089, E6095 (2017) (indicating a primary cause of faunal declines as being climate destabilization and its interaction with other factors); Tatiana Schlossberg, *Era of 'Biological Annihilation' Is Underway, Scientists Warn*, N.Y. TIMES, July 11, 2017, https://www.nytimes.com/2017/07/11/climate/mass-extinction-animal-species.html?_r=0 (noting that climate change is "exacerbating" extinction rates); Damian Carrington, *Earth's sixth mass extinction event under way, scientists warn*, GUARDIAN (July 10, 2017), https://www.theguardian.com/environment/2017/jul/10/earths-sixth-mass-extinction-event-already-underway-scientists-warn (including climate change in the list of causes of the current mass extinction).

calcification of exoskeletons and support structures.[59] At the same time, species across the globe vanish and disease-causing organisms and their vectors thrive, leading to an increased risk of epidemic in human and non-human organisms alike.[60] The loss and degradation of other species threatens the world's food supply and the health of humans, and reinforces the threat to declining species themselves. The result of this massive disruption is not only direct mortality and injury, but also threat multiplication and an increase in global conflict.[61] The increase in extreme weather events, the disruption and displacement from climatic impacts, the loss of biodiversity, and the associated anxiety, negatively affect the world's population both spiritually and emotionally.[62]

The United Nations Environmental Program and the World Meteorological Organization, recognizing that climate change posed a threat, created the Intergovernmental Panel on Climate Change ("IPCC") in 1988, in order to pool scientific efforts to record and predict climate change and its impacts and to identify mitigation and adaptation strategies.[63] In 2014, the IPCC released its fifth report, "Climate Change 2014: Impacts, Adaptation, and Vulnerability."[64] By shifting from a focus on mitigation to a focus on

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[59] *See, e.g.*, Andrea Y. Frommel et al., *Ocean Acidification has Lethal and Sub-Lethal Effects on Larval Development of Yellowfin Tuna* Thunnus Albacares, 482 EXPERIMENTAL MARINE BIOLOGY & ECOLOGY 18, 18, 23 (2016) (identifying negative impacts of ocean acidification on larval development); Kristy J. Kroeker et al., *Meta-Analysis Reveals Negative Yet Variable Effects of Ocean Acidification on Marine Organisms*, 13 ECOLOGY LETTERS 1419, 1419 (2010) (demonstrating negative effects across marine organisms from acidification).

[60] Matthew C. Fisher et al., *Emerging fungal threats to animal, plant and ecosystem health*, 484 NATURE 186, 191 (2012) (discussing recent increase in fungal epidemics and their relationship to climate shifts); *Climate change and human health: risks and responses*, *Summary: Climate change and infectious diseases*, WORLD HEALTH ORG. (2003), http://www.who.int/globalchange/climate/summary/en/index5.html (summarizing expected increases in disease in humans as a result of climate change).

[61] Dana Nuccitelli, *NATO joins the Pentagon in deeming climate change a threat multiplier*, BULL. ATOMIC SCIENTISTS (May 25, 2017), https://thebulletin.org/nato-joins-pentagon-deeming-climate-change-threat-multiplier10790 (noting that reports from both NATO and the United States Defense Department view climate change as an exacerbating factor in undermining peace and stability across the globe).

[62] *See, e.g.,* Glenn Albrecht et al., *Solastalgia: the distress caused by environmental change*, 15 AUSTL. PSYCHIATRY S95, S95–98 (2007) (introducing the term "solastagia" as a way to describe the loss of the solace of one's environment through factors such as climate change); Andoot & Pacheco, *supra* note 56, at 993–94 (identifying negative impacts on cognitive development of children from climate change); François Bourque & Ashlee Cunsolo Willox, *Climate change: The next challenge for public mental health?*, 26 INT'L REV. OF PSYCHIATRY 415, 416–19 (2014) (discussing the relationship between climate change and mental health); Cameron Harrington, *The Ends of the World: International Relations and the Anthropocene*, 44 MILLENNIUM J. OF INT'L STUD. 478, 480–81 (2016) (indicating the political, ethical, and social impacts of climate change and other Anthropocene phenomena).

[63] *Organization*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, https://www.ipcc.ch/organization/organization.shtml (last visited Nov. 23, 2017).

[64] *See Activities: Fifth Assessment Report*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, http://ipcc.ch/activities/activities.shtml (last visited Dec. 19, 2017).

adaptation and vulnerability, the IPCC made clear that, by 2014, climate change impacts were no longer potentially occurring, they were undeniable.

As the IPCC and other such reports indicate, people across the globe are experiencing the nascent effects of climatic destabilization.[65] These effects include drought, induced starvation, and migration in Central America, loss of home and life through catastrophic storms and wildfires in the United States, Europe, and the Caribbean, and illness and death from respiratory stress and extreme temperatures such as heatwaves across the globe.[66] At present, the world community, particularly the big three emitters, the United States, China, and India, can still act to prevent the worst climate change impacts. However, even now, climate change is no longer fully reversible, and the longer the world waits, the less chance there is to halt its most catastrophic effects.

B. The Difficulty of Addressing Climate Change Legally

The law is built to address situations where the cause and the harm are sufficiently linked in time and space, such that the cost is (relatively) easy to calculate and the redress is localized. In contrast, the injury of climate change is dislocated in time and space from its cause. The molecule of CO_2 emitted by a car driven in Seattle in 2017 might impact sea levels on Kirabati's shores the following year.[67] The same molecule might also increase the severity of

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[65] *AAAS Board Statement on Climate Change*, AM. ASS'N ADVANCEMENT OF SCI., (Dec. 6, 2006), http://www.aaas.org/sites/default/files/migrate/uploads/aaas_climate_statement.pdf ("The scientific evidence is clear: global climate change caused by human activities is occurring now, and it is a growing threat to society.").

[66] Damian Carrington, *Climate change already bringing disease, air pollution and heatwaves*, GUARDIAN (Oct. 30, 2017), https://www.theguardian.com/environment/2017/oct/30/climate-change-already-damaging-health-of-millions-globally-report-finds; *see also* Niraj Chokshi & Maggie Astor, *Hurricane Harvey: The Devastation and What Comes Next*, N.Y. TIMES (Aug. 28, 2017), https://www.nytimes.com/2017/08/28/us/hurricane-harvey-texas.html?; Stephanie Leutert, *Climate Change-Induced Migration from Central America*, LAWFARE BLOG (June 21, 2017, 10:30 AM), https://www.lawfareblog.com/climate-change-induced-migration-central-america; Fraces Robles et al., *Official Toll in Puerto Rico: 64. Actual deaths May be 1,052*, N.Y. TIMES (Dec. 9, 2017), https://www.nytimes.com/interactive/2017/12/08/us/puerto-rico-hurricane-maria-death-toll.html; Scott Wilson et al., *Ferocious wildfires ravage Southern California, evacuating communities and destroying homes*, WASH. POST (Dec. 7, 2017), https://www.washingtonpost.com/news/ post-nation/wp/2017/12/06/ ferocious-wildfires-burn-across-southern-california-destroying-homes-and-forcing-thousands-to-evacuate/?utm_term=e65293bf9d26; *Central America: Drought—2014-2017*, RELIEF WEB DISASTERS, https://reliefweb.int/ disaster/dr-2014-000132-hnd (last visited Dec. 26, 2017); *see also* Nick Watts et al., *The Lancet Countdown: tracking progress on health and climate change,* 381 LANCET 1151 (2017).

[67] Ada Carr, *Kiribati Developing Plans to Fight Against Climate Change, Rising Seas*, WEATHER CHANNEL (Nov. 22, 2017), https://weather.com/news/news/2017-11-22-kiribati-climate-change-threat-developments (describing impact of rising seas on Kiribati).

a forest fire in the mountains east of Seattle in 2217. Thus, that single molecule will result in harm far, both in space and time, from its original site of emission. Furthermore, the nation bearing the cost of refraining from emitting these gases does not receive a proportional share of the benefits of reduced impacts of climate change. For example, while developed countries, particularly the United States,[68] have contributed significantly more greenhouse gases to the atmosphere, developing countries, such as Chad, are most vulnerable to the *effects* of climate change.[69] This disconnect between cause and effect, "the physical spillover" both geographically and temporally, makes resolving global commons issues difficult.

The geographical range and complex dynamics of these problems arise out of their impact on the global commons—resources such as the ocean and atmosphere—that are out of "the political reach of any one nation state."[70] International law struggles to address the geographical reach of environmental commons issues that stretch across the globe. It fails to touch the vast temporal dislocation of climate change where current actions will harm populations occupying the planet centuries from now.[71]

One type of treaty strategy to deal with global commons issues is to address the commons element itself. For example, the United Nations Convention on the Law of the Sea ("UNCLOS") creates a jurisdictional framework and enforcement mechanism for the ocean, while similarly identifying the global responsibility for it as a commons.[72] A second approach

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[68] Makiko Sato & James Hansen**,** *Fossil Fuel CO_2 Emissions*, http://www.columbia.edu/~mhs119/CO2Emissions/Emis_moreFigs/ (last visited Dec. 14, 2017) (showing that the U.S. is responsible for 25% of the world's historic emissions from 1751–2013).

[69] *See* Hakim Abdi, *Where is the most vulnerable country to climate change?* CLIMATE CHANGE NEWS (June 13, 2017), http://www.climatechangenews.com/2017/06/13/vulnerable-country-climate-change/ (identifying a recent study that rated Chad as the country most vulnerable to climate change); *see also* Adel Daoud et al., *What is the Association between Absolute Child Poverty, Poor Governance, and Natural Disasters? A Global Comparison of Some of the Realities of Climate Change*, 11 PLOS ONE 1, 16 (2016) (finding that "natural disasters victimization correlates with increasing rates of child poverty"); Luke J. Harrington et al., *Poorest Countries Experience Earlier Anthropogenic Emergence of Daily Temperature Extremes*, 11 ENVTL. RES. LETTERS 1, 7 (2016) (noting "if cumulative emissions continue to increase at current rates, the impacts, in terms of frequency of heat extremes, will become significantly worse for poorer nations when compared with their wealthier counterparts.").

[70] CHRISTOPHER D. STONE, SHOULD TREES HAVE STANDING?: LAW, MORALITY, AND THE ENVIRONMENT 126 (2010).

[71] *See, e.g.*, David A. Weisbach & Cass R. Sunstein, *Climate Change and Discounting the Future: A Guide for the Perplexed*, 27 YALE L. & POL'Y REV. 433, 434–35 (2009) (discussing the "cost discounting" approach to policy, whereby in cost-benefit analysis, costs distant in the future are discounted relative to those occurring more immediately).

[72] *United Nations Convention on the Law of the Sea Overview*, UN, http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm (last updated May 4, 2017).

is to address a specific type of harm to commons, such as depletion of the ozone layer, and produce a multilateral treaty specifically targeting the sources causing that harm. The Montreal Protocol on Substances that Deplete the Ozone Layer ("Montreal Protocol") is an example of this type of treaty.[73] Both UNCLOS and the Montreal Protocol address issues that spillover across national boundaries. Both also have moderate to high reported compliance levels.[74] The Montreal Protocol has even proven to be flexible enough to incorporate novel restrictions related to climate change mitigation.[75]

Climate change involves the commons issues covered by both UNCLOS and the Montreal Protocol: the ocean and the atmosphere. However, the complicated nature of climate change, where the cause includes a number of molecular components of carbon emissions and the impacts affect all commons issues, requires a different sort of treaty than either of these international agreements. In addition, the painful choices necessary to adequately deal with the problem mean leaders must risk their political position, particularly in democratic governments, by embracing unpalatable decisions. For example, one of the IPCC's "stringent" analytical scenarios, Representative Carbon Pathway 2.6 ("RP2.6"), mandates carbon cuts in the future akin to the decreases seen in modern history only during times of economic collapse, such as during the Great Depression of the 1930s.[76] This potentially requires a curtailment of developed economies and a willingness to forgo development, or at least industrialize along a different trajectory, in developing economies.[77] Finally, the addition of the component of deep temporal spillover renders climate change a "super wicked problem."[78] There

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[73] *The Montreal Protocol on Substances that Deplete the Ozone Layer*, UNEP OZONE SECRETARIAT, http://ozone.unep.org/en/treaties-and-decisions/montreal-protocol-substances-deplete-ozone-layer (last visited Oct. 7, 2017).

[74] *See, e.g.*, Stephen Leahy, *Without the Ozone Treaty You'd Get Sunburned in 5 Minutes*, NAT'L GEOGRAPHIC NEWS, Sept. 25, 2017, http://news.nationalgeographic.com/2017/09/ montreal-protocol-ozone-treaty-30-climate-change-hcfs-hfcs/ (describing the Montreal Protocol).

[75] Mohamed Atani, *The Kigali Amendment to The Montreal Protocol: Another Global Commitment to Stop Climate Change*, U.N. ENV'T (Dec. 8, 2016), http://www.unep.org/africa/news/kigali-amendment-montreal-protocol-another-global-commitment-stop-climate-change.

[76] *See* Damian Carrington, *Ambitious 1.5C Paris Climate Target is Still Possible, New Analysis Shows*, GUARDIAN (Sept. 18, 2017), https://www.theguardian.com/environment/2017/sep/18/ambitious-15c-paris-climate-target-is-still-possible-new-analysis-shows (describing the requirements of RCP 2.6); GP Wayne, *Now Available: A Guide to The IPCC's New RCP Emissions Pathways*, GUARDIAN (Aug. 30, 2013), https://www.theguardian.com/environment/climate-consensus-97-per-cent/2013/aug/30/climate-change-rcp-handy-summary (sketching the various Representative Carbon Pathways, including RCP2.6).

[77] *But see* Mark Z. Jacobson et. al., *Roadmaps to Transition Countries to 100% Clean, Renewable Energy for All Purposes to Curtail Global Warming, Air Pollution, and Energy Risk*, 5 EARTH'S FUTURE 948, 948, 951 (2017) (positing a potential pathway to mitigating climate change that does not necessarily require a halt to all development).

[78] Lazarus, *supra* note 30, at 1153, 1159.

is no clear framework in existence to successfully "develop, implement and maintain the laws necessary" to combat climate change.[79]

On top of this, the transcendence by climate change of time and space, as well as its "haunting" nature, means that people, both the populace and its leaders, fail to fully grasp the existence and threat of climate change.[80] Parties struggle to understand the immensity of the danger. A threat that is so diffused and scattered in time and space is much harder to experience than something immediate and targeted such as nuclear saber rattling.[81] Thus, because they and their people cannot fully understand the threat, governments continue to balance ongoing, increasing, and often underestimated risks of climate change against immediate economic impacts. This results in decisions that favor immediate economic concerns rather than much greater long-term economic costs.[82]

Ultimately, acting on climate change requires a global commitment. It requires the developed world to accept its responsibility and the risks to which it continues to subject the world with excessive emissions. It requires developing countries, such as India, to accept that developing in the same manner as the United States will doom the world and its own citizens to a far less hospitable future.

III. AGENDA 21: ITS STRUCTURE, IMPLEMENTATION, AND EFFECTIVENESS

The goal of Agenda 21 is sustainable development, or the attempt to harness resources for present day populations in a manner that ensures future generations will also have access to sufficient resources. Agenda 21 includes "the atmosphere" as an element to consider in sustainable development, along with pollution, poverty, and economic development.[83] It is a framework for

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[79] *Id.* at 1160–62.

[80] ORR, *supra* note 56, at 74 (noting that we don't even have a word to describe this calamity). Timothy Morton calls climate change a "hyperobject," one that that is so vast temporally and spatially that we cannot conceive of them within the structure of traditional thought. *See generally* TIMOTHY MORTON, HYPEROBJECTS: PHIL. & ECOLOGY AFTER THE END OF THE WORLD (2013).

[81] *See, e.g.*, *'Massive military response' if N Korea fires nukes: US*, AL JAZEERA (Oct. 28, 2017), http://www.aljazeera.com/news/2017/10/military-response-korea-fires-nukes-171028074343644.html (quoting U.S. Secretary of Defense, Jim Mattis's response to questions about potential nuclear conflict).

[82] Stephen Leahy, *Hidden Costs of Climate Change Running Hundreds of Billions a Year*, NAT'L GEOGRAPHIC NEWS (Sept. 27, 2017), https://news.nationalgeographic.com/2017/09/climate-change-costs-us-economy-billions-report/ (describing the recent report calculating costs of climate change impacts to the U.S. of at least $240 billion per year for the past ten years).

[83] Rep. of the World Commission on Environment and Development, Our Common Future. U.N. Doc. A/42/427, at 43 (1987) [hereinafter Brundtland Rep.] (defining sustainable development as "development

economic development rather than an attack directly on global commons problems. Global commons such as the atmosphere are considered within the text of Agenda 21.[84] However, rather than directly identifying specific goals for a commons problem, such as ozone pollution, Agenda 21 indicates that parties should include consideration of means for pollution reduction in policy approaches.[85] That said, similar to agreements targeting global commons issues, sustainable development action requires multiple governmental parties willing to sacrifice immediate economic rewards for future benefits. Agenda 21 explicitly states in its preamble that there is a need for global collaboration for sustainable development, noting "[n]o nation can achieve this on its own; but together we can—in a global partnership for sustainable development."[86]

Below this Comment describes, briefly, the process that led to Agenda 21. It then describes Agenda 21's legal structure, focusing on Chapter 8 and Chapter 38 in particular, as they provide the basis for the national inventory and reporting. This Comment provides examples of the implementation of these chapters from three countries: India, the United States, and Zambia. Finally, it evaluates the legal effectiveness of Agenda 21.

A. The Origin of Agenda 21

Agenda 21 emerged out of the Rio Conference at the same time as the UNFCCC, the Rio Declaration, and several other important environmental agreements.[87] At this conference, sustainable development and conservation was placed at the forefront of global policy. This foregrounding of sustainable development occurred as it was becoming clear that development without consideration for sustainability, poverty, and the environment was harmful.[88] Its goal was to integrate sustainable development into developmental processes via national plans coordinated across parties through a "new global partnership."[89]

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that meets the needs of the present without compromising the ability of future generations to meet their own needs.").

[84] *Agenda 21*, *supra* note 24, at ¶ 9.1–9.35.

[85] *Id.*

[86] *Id.* at ¶ 1.1.

[87] Apart from Agenda 21 and the UNFCCC, agreements included the Rio Declaration on Environment and Development, the Statement of Forest Principles, and the United Nations Convention on Biological Diversity.

[88] The term "sustainable development" is identified by the Oxford English Dictionary as first appearing in 1972. *Sustainable development*, OXFORD ENGLISH DICTIONARY (3d ed. Mar. 2012).

[89] *Agenda 21*, *supra* note 24 at ¶¶ 1.3, 2.1. Agenda 21 is a sister instrument to the Rio Declaration, providing the extensive analysis and suggestions for structural implementation of the principles of the Rio Declaration. Ben Boer, *Institutionalizing Ecologically Sustainable Development: The Roles of National,*

The 1972 Conference on the Human Environment, in Stockholm, was the first time the United Nations ("UN") focused specifically on environmental health.[90] In 1983, the U.N. convened the United Nations World Commission on Environment and Development to respond to growing concerns about rates of development, increasing poverty, and negative impacts on the environment.[91] In 1987, the commission presented Our Common Future, also known as the Brundtland Report.[92] The strongly worded Brundtland Report recognized that development without regard for environmental harms created, at times, "life-threatening hazards."[93] According to the report, "[t]his new reality, from which there is no escape, must be recognized and managed."[94] The report was ultimately aimed at identifying how the international community might start to address these problems. It called for "decisive political action to begin managing environmental resources."[95]

The General Assembly Resolution 44/228 of December 1989 followed and called for a more integrated approach to development and the environment.[96] This resolution ultimately resulted in Agenda 21. The Conference Security General, Maurice Strong, called Rio a "'historic moment for humanity.'" He indicated that "[a]lthough Agenda 21 had been weakened by compromise and negotiation . . . it was still the most comprehensive and, if implemented, effective program[] of action ever sanctioned by the international community."[97] Thus, while Agenda 21 still aimed for the Brundtland Report's hope of "a new era of economic growth, one that must be based on policies that sustain and expand the environmental resource base . . . [and] relieve the great poverty that is deepening in much of the developing world," it did not impose any obligations on parties to actually implement these policies.[98] The resulting agreement is an action plan for sustainable

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State, and Local Governments in Translating Grand Strategy in to Action, 31 WILLAMETTE L. REV. 307, 314 (1995).

[90] Sustainable Development Knowledge Platform, United Nations Conference on the Human Environment (Stockholm Conference), https://sustainabledevelopment.un.org/milestones/humanenvironment (last visited Feb. 3, 2018). *See also* Richard Black, *Stockholm: Birth of the green generation*, BBC News (June 4, 2012), http://www.bbc.com/news/science-environment-18315205.

[91] Brundtland Rep, *supra* note 83 (describing the creation of the commission and subsequent publication of the Bruntland Report).

[92] *Id*. at 43.

[93] *Id*. at IV(1).

[94] *Id*.

[95] *Id*. at IV(4).

[96] G.A. Res. 44/228 at II (Dec. 22, 1989).

[97] UNCED, *supra* note 23.

[98] Brundtland Rep., *supra* note 83, at IV(3).

development and, as such, it is nonbinding, or "soft-law."[99] It suggests, but does not oblige, signatories to take particular actions.

The text of Agenda 21 asserts that integrating environmental and development concerns into all levels of government will result in satisfaction of "basic needs, improved living standards for all, better protected and managed ecosystems, and a safer, more prosperous future."[100] Agenda 21 thus broadly mandates integrating an evaluation of environmental and economic effects across development decisions. It is therefore more of an attempt at cooperative norm-building than a rationalist approach to lawmaking, where deterrence is often a large component of the regime.[101] The effectiveness of this approach requires governments to make behavioral adjustments such that decisions are made with the idea of sustainability as a default to a sort of norm of law.[102] These cooperative agreements work because parties want to comply to be in good standing with other countries.[103] While Agenda 21 lacked obvious teeth, this by no means assured that it would fail to shift signatories' behavior. As an international plan, it was enacted consistent with the principle of *pacta sunt servanda*, which indicates that parties to international plans and agreements should negotiate in good faith.[104] Thus, Agenda 21 was enacted with the expectation that parties would do their best to respond to its guidance, creating what may be viewed as a political commitment, while at the same time not resulting in any sort of legal obligation.[105]

B. The Structure of Agenda 21: Chapters 8 and 38

Agenda 21 and Chapters 8 and 38 focus on creating general recommendations for action at the national level and a structure to report these

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[99] *See, e.g.*, Agenda 21: Programme of Action for Sustainable Development, EISIL, http://www.eisil.org/index.php?sid=500461557&id=620&t=link_details&cat=0&having=342305 (last visited Dec. 19, 2017) (describing, briefly, Agenda 21).

[100] *Agenda 21*, *supra* note 24, at ¶ 1.1.

[101] *See, e.g.*, Kal Raustiala, *Compliance & Effectiveness in International Regulatory Cooperation*, 32 Case W. Res. J. Int'l L. 387, 404–09 (2000) (describing norm driven approaches to international agreements).

[102] *Id.*; *see also* OONA HATHAWAY & HAROLD HONGJU KOH, FOUNDATIONS OF INTERNATIONAL LAW & POLITICS 2–3 (2004).

[103] Raustiala, *supra* note 101, at 404–09.

[104] Roughly, "agreements must be kept." *Pacta sunt servanda*, OXFORD ENGLISH DICTIONARY (3d ed. Mar. 2012); *see also*, *Pacta Sunt Servanda*, INT'L JUD. MONITOR (Sept. 2008) http://www.judicialmonitor.org/archive_0908/generalprinciples.html.

[105] *Agenda 21*, *supra* note 24, at Preamble ¶ 3 (noting that Agenda 21 "reflects a global consensus and political commitment.").

actions.[106] Chapter 8 aims for "progressive integration of environmental and developmental issues" across all levels of national governance.[107] Chapter 38 calls for the creation of the Commission on Sustainable Development ("CSD") as an international body focused on facilitating reporting and other aspects of Agenda 21.[108]

Chapter 8 proposes States "strengthen institutional structures to allow the full integration of environmental and developmental issues."[109] It calls for national reviews of "economic, sectoral and environmental policies, strategies and plans to ensure the progressive integration of environmental and developmental issues,"[110] and the establishment of "domestically determined procedures to integrate environment and development issues in decision-making."[111] These "objectives," while fairly direct, are to be taken through "countries . . . develop[ing] their own priorities in accordance with their prevailing conditions."[112] Thus, at the outset, States have full discretion in the shape, form, and outcome of their national review and domestically determined procedures, provided they can argue that environmental and socio-economic issues are considered.

Section 8.4 more specifically indicates activities to move governments toward sustainable development considerations in decision-making. It states that "[g]overnments should conduct a national review and, where appropriate, improve the processes of decision-making."[113] "Should," as used here, is the language of legal recommendation.[114] This section thus urges, but does not compel, States to review their own structures for decision-making and adopt a "domestically formulated policy framework" to better achieve the goals of progressively integrating environmental and development concerns.[115] It indicates that "[c]ountries will develop their own priorities in accordance with [their own] national plans, policies and program[]s."[116] The term "will" does not rise to the level of obligation that is true of the term "shall," but rather is

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[106] *Id.* at ¶¶ 8.1–8.54, 38.1–38.45. Integrating environment and development in decision-making, 38 International Institutional Arrangements. Agenda 21 is comprised of four sections and 40 chapters total. Chapter 8 is in Sec. 1 and Chapter 38 is in Sec. 5.

[107] *Id.* at ¶¶ 8.2, 8.3.

[108] *Id.* at ¶ 38.11.

[109] *Id.* at ¶ 8.3(b).

[110] *Id.* at ¶ 8.3(a).

[111] *Id*. at ¶ 8.3(d).

[112] *Id.* at ¶¶ 8.2, 8.3.

[113] *Id.* at ¶ 8.4.

[114] Bodansky, *supra* note 13, at 145 (identifying "should" as recommending behavior).

[115] *Agenda 21*, *supra* note 24, at ¶ 8.4(b).

[116] *Id.* at ¶ 8.4.

a term of expectation.[117] It is further qualified here by the discretionary "in accordance with" the specific constraints of the particular country.[118] The plan, therefore, does not prescribe particular state targets or approaches, but rather indicates that the states themselves have full latitude in designing, developing, and implementing sustainable development policies. Thus, the plan employs a "bottom-up" rather than a "top-down" approach.[119]

Section 8.7 states that governments "should adopt a national strategy for sustainable development based on, inter alia, the implementation of decisions taken at the Conference, particularly with respect to Agenda 21."[120] This action is to be country-specific, although international organizations might cooperate to create a "country-driven sustainable development strategy."[121] The ultimate goal "should be to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations."[122]

Chapter 38 creates the CSD and identifies its role in collating and analyzing reports from parties. More specifically, Section 38.13(b) notes that "[t]he Commission on Sustainable Development should have the following functions . . . [such as to] . . . consider information provided by Governments including, for example, information in the form of periodic communications or national reports."[123] Paragraph 38.38 further notes that "States could consider the preparation of national reports . . . Countries could also consider the preparation of national action plans for the implementation of Agenda 21."[124]

In 1997, the international community agreed on a plan to further implement Agenda 21. This plan recommended all States create National Sustainable Development Strategies ("NSDSs") by 2002, as identified originally in Chapter 8.7.[125] The plan, as adopted by the General Assembly,

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[117] Bodansky, *supra* note 13, at 145 (indicating that "will" can serve as expectation).
[118] *Agenda 21*, *supra* note 24, at ¶ 8.4.
[119] *See, e.g.*, BODANSKY ET AL., *supra* note 11, at 13, 351 (defining "bottom-up" agreements).
[120] *Agenda 21*, *supra* note 24, at ¶ 8.7.
[121] *Id.*
[122] *Id.*
[123] *Id.* at ¶ 38.13(b).
[124] *Id.* at ¶ 38.38.
[125] G.A. Res. A/RES/S-19/2, Programme for the Further Implementation of Agenda 21, at ¶ 24(a) (Sept. 19, 1997) [hereinafter Programme for the Further Implementation of Agenda 21]; *see also* John C. Dernbach, *Chapter 32: National Governance*, *in* 723 STUMBLING TOWARD SUSTAINABILITY (John C. Dernbach ed., 2002) (describing the process of the resolution). The push for submitting NSDSs resulted, in part, from the

also reiterates the language of Agenda 21, Chapter 38 in suggesting that "countries may wish to submit to the Commission, on a voluntary basis, information regarding their efforts to incorporate the relevant recommendations of other United Nations conferences in national sustainable development strategies."[126] Agenda 21 in Chapter 8, 38 and through the plan for further implementations indicates that national implementation should occur through self-evaluation, identification of areas for improvement, creation of a general strategy, or NSDS.

C. The Implementation of Agenda 21

The national reports standardized and made public by the CSD indicate how individual parties implemented Agenda 21.[127] They therefore provide some evidence for its effectiveness. Similarly, the proportion of countries reporting and the evaluation of the reporting experience provide evidence specifically about the impact of the reporting aspects of both Chapters 8 and 38.

For the purposes of this analysis, this Comment looks to reports prepared for the ten-year follow up conference, the World Summit on Sustainable Development ("Earth Summit") in 2002.[128] Specifically, this Comment summarizes reports produced for three nations: India, the United States, and Zambia.[129] For the most part, these reports, within each country,

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issues raised in the 1996 report of the Organization for Economic Cooperation and Development ("OECD"). *Id.* at 725; *see* OECD, SHAPING THE 21ST CENTURY: THE CONTRIBUTION OF DEV. CO-OPERATION 10 (1996).

[126] Programme for the Further Implementation of Agenda 21, *supra* note 125, at ¶ 133(b).

[127] *See, e.g.*, U.N., India Country Profile, Johannesburg Summit 2002, at 111 (2002), http://www.un.org/esa/agenda21/natlinfo/wssd/india.pdf (identifying legal pathways of implementation) [hereinafter India Country Profile]; BODANSKY ET AL., *supra* note 11, at 212–18 (indicating that implementation of international agreements at the national level involves executive/administrative, legislative and judicial approaches); *see, e.g.*, CSD, *Institutional Aspects of Sustainable Development in Mexico* (Apr. 1999), http://www.un.org/esa/agenda21/natlinfo/countr/mexico/inst.htm. *See* John C. Dernbach, *Reflections on Comparative Law, Environmental Law, and Sustainability*, 2 WIDENER L. SYMP. J. 279, 282 (1998) (identifying this effort towards reporting standardization). The "Institutional" section of these indicators contains identification of national decision-making structures as called for by Chapter 8.

[128] At this conference, world leaders and representatives of nongovernmental organizations gathered in Johannesburg to review progress in attaining sustainable development goals, and to identify how achievement of these goals might be furthered through structural and other changes. U.N. Background Release ENV/DEV/J/1 (Aug. 24, 2002), http://www.un.org/events/wssd/summaries/envdevj1.htm.

[129] I selected these countries for the following reasons. First, I looked for industrialized and industrializing nations to compare. I started with India because it identified judicial as well as executive and legislative actions which was unusual. Furthermore, India faces challenges both in its environment and in its level of poverty. It is estimated that approximately one-third of the people living in extreme poverty reside in India. Nilanjana Bhowmick, *India is Home to More Poor People Than Anywhere Else on Earth*, TIME (July 17, 2014), http://time.com/2999550/india-home-to-most-poor-people/. As a comparison, the United

identify systems in place prior to Agenda 21, with some examples of legislative and executive/administrative actions taken in response to the agreement. Agenda 21 is not a treaty and countries therefore do not enact it directly as enforceable law. Rather, it aims to shift more general policies and decision making about development. That said, Agenda 21 does indicate that countries should include a means for judicial remedying of actions that impact the environment and development.[130] Some countries, such as India, include a discussion of judicial proceedings in the report.[131] The countries differ in their interpretation of what integrating sustainable development into decision-making looks like. For India and Zambia, sustainable development primarily involves including environmental considerations in decision-making, whereas for the United States, it involves weighing economic and environmental factors against each other.

1. India's Ten-Year Report

India's report focuses on including environmental considerations across decision-making processes. It indicates that Agenda 21 is consistent with India's long-time integration of environmental considerations into political decisions.[132] India identifies the National Environmental Council as a high-level coordinating body and the country's Five-Year Plans as important policy statements of primary importance to the incorporation of sustainable development considerations nationally.[133] The report notes that targets were

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States is the poster-child for industrialization and overconsumption. *See*, *e.g.* AM. ASS'N FOR THE ADVANCEMENT OF SCI., *Natural Resources: Introduction*, POPULATION & NAT. RES., ATLAS OF POPULATION & ENV'T, http://atlas.aaas.org/index.php?part=2 (last visited Dec. 4, 2017). Both India and the United States wield power on the global stage and there is often a tension between India and the United States in negotiating international environmental agreements. *See*, *e.g.*, T.P. Sreenivasan, *Cool down the rhetoric*, HINDU (May 22, 2017), http://www.thehindu.com/opinion/op-ed/cool-down-the-rhetoric/article18519996.ece (noting that negotiations at Rio reached a "fine balance struck by India and the U.S. [that] culminated in the Agenda 21."); *see also* Ben Westcott, *Reluctant signatory India takes moral high-ground on Paris climate deal*, CNN (June 2, 2017), http://www.cnn.com/2017/06/02/asia/india-paris-agreement-trump/index.html (describing President Modi of India's response to President Trump's announcement that the U.S. would withdraw from Paris Agreement). In contrast, Zambia does not hold the same negotiating power on the global stage and is considered by the United Nations to be a "least developed country," with substantial natural resources and challenges in development that are not reflected in the concerns of the U.S. or India. *See, e.g.* Ruth Gordan, *Unsustainable Development*, *in* INT'L ENVTL. LAW & THE GLOBAL S. (Shawkat Alam, Sumudu Atapattu, Carmen G. Gonzalez & Jona Razzaque eds., 2015) 50, 50–73.

[130] *Agenda 21*, *supra* note 24, at ¶¶ 8.17(b), 8.18.

[131] CSD, Institutional Aspects of Sustainable Development in India (Apr. 1, 1997), http://www.un.org/esa/agenda21/natlinfo/countr/india/inst.htm.

[132] India Country Profile, *supra* note 127; *see also* GOV'T OF INDIA, THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, *Agenda 21 — An Assessment*, Chapter 2, 23. (2002), http://envfor.nic.in/content/agenda-21-assessment.

[133] India Country Profile, *supra* note 127, at 41.

incorporated into the Tenth Five-Year Plan, which starts the year of the Earth Summit, that are consistent with sustainable development goals.[134]

India identifies additional policy statements consistent with sustainable development, including the National Conservation Strategy and Policy Statement on the Environment, the Policy Statement for Abatement of Pollution, and the National Conservation and Policy Statement on Environment and Development.[135] The report notes that an Environment Action Program was developed in 1993 to include environmental considerations in development decisions.[136] At the time of the report, India's NSDS was in the final stages leading up to adoption.[137]

The report includes an extensive list of legislative and regulatory actions consistent with integrating environmental considerations into decision-making.[138] Legislative actions identified in the report include the New Biodiversity Bill and the National Environment Tribunal Act.[139] Regulatory actions include the Hazardous Wastes ("Management and Handling") Rules and the Prevention and Control of Pollution (Informed Consent Procedure) Rules.[140] To demonstrate India's commitment to using legal structures to protect the environment, a National Appellate Authority was created in 1997 to address appeals from proposals restricted or rejected by the government because of potential harmful environmental impacts.[141] The report also notes that India had made progress setting up the hardware and software tools to track implementation of sustainability ideas into governmental decision-making.[142]

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[134] The goals include: "Reduction of: poverty ratio by 5% by 2007 and by 15% by 2012; gender gaps in literacy and wage rates by at least 50% by 2007; the decadal rate of population growth between 2001 and 2011 to 16.2%; Infant mortality rate (IMR) to 45 per 1000 live births by 2007 and to 28 by 2012; and, Maternal Mortality Ratio (MMR) to 2 per 1000 live births by 2007 and to 1 by 2012; Provision of gainful high- quality employment to the addition to the labor force over the Tenth Plan period; Increase in Literacy rate to 75 % within the Plan period; All children in school by 2003; all children to complete 5 years of schooling by 2007; Increase in forest and tree cover to 25% by 2007 and 33% by 2012; All villages to have sustained access to potable drinking water within the Plan period; and, Cleaning of major polluted rivers by 2007 and other notified stretches by 2012." *Id*.

[135] *Id*.

[136] GOV'T OF INDIA, *supra* note 132, at 24.

[137] India Country Profile, *supra* note 127.

[138] *Id.* at 42–43, 126–27.

[139] *Id*.

[140] *Id*.

[141] *Id*. The Appellate Court was replaced by a National Green Tribunal in 2010. *See* Wendy Zeldin, *India: New Green Tribunal Established*, GLOBAL LEGAL MONITOR, Jan. 6, 2011, http://www.loc.gov/law/foreign-news/article/india-new-green-tribunal-established/.

[142] India Country Profile, *supra* note 127.

The report indicates areas for improvement, include expanding analytical approaches as well as increased enforcement and performance evaluation.[143] For example, the report identifies the Environmental Impact Assessment ("EIA") as an appropriate analytical tool for expansion, although it is already a statutory requirement for several development activities.[144]

The judiciary, according to the report, has an increasing role in environmental protection in India.[145] One case directly discusses Agenda 21: *Vellore Citizens Welfare Forum v. Union of India & Ors 2*. In this case, the court ordered the government to address pollution from tanneries in Tamil Nadu. The court used the "precautionary principle," which requires that, in the absence of scientific certainty regarding the harm from pollution, the government needs to err on the side of caution.[146] It also raised the principle of "polluter pays," indicating that polluters must bear the cost of managing pollution to prevent harms to human health and the environment.[147] In analyzing the legal framework for the order, the court included Agenda 21 and the Brundtland Report as important texts for its decision and held that sustainable development, as defined as a balance between ecology and development, is international customary law.[148]

Five additional judicial opinions relevant to the implementation of Agenda 21 are directly mentioned in the report.[149] The opinions identify a fundamental right to a healthy environment that must be considered in the conflict between industry growth and environmental health.[150]

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[143] *Id.* at 41–43.

[144] *Id.* at 41.

[145] GOV'T OF INDIA, *supra* note 132, at 35.

[146] This case is not directly cited in the report but is instructional in its direct inclusion of Agenda 21. *See generally* Vellore Citizens Welfare Forum v. Union of India, 5 S.C.C. 647 (Aug. 28, 1996); *see also* BODANSKY ET AL., *supra* note 11, at 43 (defining "precautionary principle").

[147] *See generally* Vellore Citizens Welfare Forum, 5 S.C.C. 647 (Aug. 28, 1996); Grantham Res. Institute on Climate Change & the Environment, *What is the polluter pays principle?*, Feb. 17, 2014, http://www.lse.ac.uk/GranthamInstitute/faqs/what-is-the-polluter-pays-principle/ (last visited Dec. 12, 2017) (defining "polluter pays principle").

[148] Vellore Citizens Welfare Forum v. Union of India, 5 S.C.C. 647 (Aug. 28, 1996). There is disagreement as to whether sustainable development is customary law; however, its widespread identification as a goal might support its role as a fairly general principle of customary law. *See*, *e.g.*, Virginie Barral, *Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm*, 23 EUROPEAN J. INT'L L. 377, 385–88 (2012).

[149] CSD, *supra* note 131.

[150] The five opinions summarized in the report are as follows: Mathew Lukose vs. Kerala State Pollution Control Board, 2 Kerala L.J. 717 (1990) (providing for a fundamental right to a healthy environment and identifying the conflict between industry growth and the risk of infringement upon this right); M.C. Mehta vs. Union of India, 2 Scale S.P. 89 (1996) (requiring industry to cooperate with the construction of common Effluent Treatment Plants (CETPs) in 28 industrial areas in Delhi); Subhash Kumar vs. State of

2. The United States' Ten-Year Report[151]

Rather than focusing on the incorporation of environmental issues into decision-making, as India does, the United States report focuses on decision making that balances environmental, social, and economic considerations. It further identifies as important those actions that facilitate communication across federal agencies, levels of government, and between public and private entities.

The United States identifies the National Environmental Policy Act ("NEPA") of 1969 as the "single coherent statement of national policy on the integration of environment and development in decision-making at the federal level," and suggests it is "perhaps the world's first statement on sustainable development."[152] The report goes on to discuss the implementation of NEPA and identifies the important role of the Environmental Impact Analysis as "a decision-making process designed to integrate environmental, economic and social concerns."[153] The report identifies the Presidential Council on Environmental Quality ("CEQ"), which oversees implementation and assists in dispute resolution under NEPA, and the Environmental Protection Agency ("EPA") as the primary federal bodies involved in reviewing the impact of

Bihar, 1 S.C.C 598 (1991), (identifying the right to a healthy environment and the control of pollution as enumerated in the Constitution Art. 21 and Art. 32); M.C. Mehta vs. Union of India, 3 Scale S.P. 58 (1996) (identifying a process for determining a process for relocation of industries near the Taj Mahal); Indian Council for Enviro-Legal Action vs. Union of India, 2 Scale 44, 73 (1996) (developing the framework for a procedure to be used in setting up chemical industries).

[151] Certain groups in the United States see Agenda 21 as an internationalist plot to take over governance of the country, halt population growth, and force the adoption of sustainable modes of action. Agenda 21 thus is term akin to conspiracy, abuse of power, and shadow governance, particularly via the right-wing "Tea Party." Commentator Glenn Beck published the thriller *Agenda 21* and politicians, such as Michele Bachmann, saw the imprint of this conspiracy in the move towards energy efficient light bulbs in governmental buildings. *Stephanie* Mencimer, *"We Don't Need None of That Smart Growth Communism,"* MOTHER JONES (Mar./Apr. 2011), http://www.motherjones.com/politics/2010/11/tea-party-agenda-21-un-sustainable-development/. *See also* AM. POL'Y, *Agenda 21*, https://americanpolicy.org/agenda21/ (last visited June 23, 2017).

[152] U.N., U.S. Country Profile, Johannesburg Summit 2002, at 31 (2002), http://www.un.org/esa/agenda21/natlinfo/wssd/usa.pdf [hereinafter U.S. Country Profile].

[153] *Id*. NEPA requires agencies considering "[f]ederal actions significantly affecting the quality of the human environment" to conduct an environmental impact analysis prior to deciding how and if to move forward with the project. National Environmental Policy Act of 1969 § 102, 42 U.S.C. § 4332 (2012). NEPA's goal is to ensure that environmental impacts are considered *prior* to a decision is made with respect to a project. *See, e.g*. Metcalf v. Daly, 214 F.3d 1135 (9th Cir. 2000) (indicating an elevated scrutiny of the NEPA analysis by NOAA in its approval of a whale hunt because the environmental concerns were evaluated *after* the decision was essentially already made).

actions on the human environment.[154] According to the report, the thirty years of NEPA implementation (from inception to approximately 2000) saw strengthening of the environmental decision-making process through agency activities and judicial analysis.[155]

The diversity of agencies and legislation involved in federal oversight of natural resources and pollution control in the United States results in some level of fragmentation of decision-making and hampers integration of sustainable development considerations.[156] According to the report, the Government Performance and Results Act of 1993 provides one mechanism for integrating decision-making across agencies. Although it does not explicitly create a sustainability analysis framework, its procedures facilitate agency collaboration on issues of development and the environment.[157] An additional set of integrative actions identified in the report are voluntary initiatives. These initiatives, such as the Partners for the Environment program, facilitate partnerships between agencies such as the EPA and private actors to improve environmental decision-making in the private sector.[158]

While these actions were already in place to some extent before the conference, the United States did work to more specifically implement Agenda 21 at the national level. Immediately after the Rio Conference, the United States established the President's Council on Sustainable Development to help implement Agenda 21 by advising the president on "strategies to achieve prosperity, opportunity, and a healthy environment."[159] This Council was the "only presidential or federal advisory panel charged with recommending policies across the full spectrum of economic, environmental, and social policy issues."[160] Beyond this, the report identifies the EPA-

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[154] U.S. Country Profile, *supra* note 152. CEQ produces the regulations guiding the implementation of NEPA. The Whitehouse, Council on Environmental Quality, https://www.whitehouse.gov/ceq (last visited Oct. 23, 2017).

[155] U.S. Country Profile, *supra* note 152. The report further emphasizes the success of NEPA as evidenced by state adoption of similar statutes.

[156] *Id*. at 31 (listing Departments of Agriculture, Defense, Energy and Commerce and notes that the EPA and the National Oceanic and Atmospheric Administration and the Department of Justice among others as overseeing national resource and pollution issues).

[157] *Id*. at 31–32; *see also* Office of Management and Budget, Government Performance Results Act of 1993, Obama White House Archives, https://obamawhitehouse.archives.gov/omb/mgmt-gpra/gplaw2m (last visited Oct. 4, 2017). The implementation of the act is overseen by the Office of Management and Budget.

[158] U.S. Country Profile, *supra* note 152.

[159] *Id. See also* CSD, Institutional Aspects of Sustainable Development in the U.S. (Apr. 1, 1997), http://www.un.org/esa/agenda21/natlinfo/countr/usa/inst.htm; *see also* President's Council on Sustainable Development Overview, Clinton Whitehouse Archives, https://clintonwhitehouse2.archives.gov/PCSD/Overview/ (last visited Sept. 19, 2017).

[160] U.S. Country Profile, *supra* note 152.

administered Common Sense Initiative as an example of partnerships for sustainability at the federal level.[161] Further integration of economic and environmental considerations is, according to the report, apparent in movements to include environmental impacts in the analysis of global trade deals. For example, Executive Order 13141 requires that major trade negotiations include analysis of potential major environmental impacts.[162] These considerations, similar to the considerations of projects under NEPA, must be undertaken early enough in negotiations to inform the negotiators.[163]

In addition to the general legislative and executive actions, the report identifies agency action as well as agency cost-benefit analysis. It identifies the environmental goals created by the EPA for clean air, ecological protection, safe drinking water, and improved understanding of the environment.[164] Finally, the report presents the risk-benefit analysis required by some environmental statutes, such as the Federal Insecticide, Fungicide and Rodenticide Act, as an example of federal integration of economic and environmental considerations required by legislation.[165]

In contrast to India, where Agenda 21 and sustainability are influential in judicial decisions, the United States does not identify any legal proceeding in its report, nor is Agenda 21 framed in judicial opinions as influential on the U.S.'s decisions relating to development and the environment.[166]

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[161] *Id*. *See also* EPA, The Common Sense Initiative: A New Generation of Environmental Protection (Apr. 1996).

[162] U.S. Country Profile, *supra* note 152. Three types of agreements must incorporate this environmental analysis: "comprehensive multilateral trade rounds; multilateral and bilateral trade agreements; and major new trade liberalization agreements in the national resource sectors." *See also* Environmental Review of Trade Agreements, Exec. Order No. 13141, 64 Fed. Reg. 63, 169 (Nov. 18, 1999), http://www.presidency.ucsb.edu/ws/index.php?pid=56947.

[163] U.S. Country Profile, *supra* note 152. The order was overseen and implemented by the United States Trade Representative and the Chair of the CEQ (the council in charge of overseeing NEPA implementation). Guidelines for incorporation of the order into negotiations were finalized in 2000. Guidelines for Implementation of Executive Order 13141: Environmental Review of Trade Agreements, 64 Fed. Reg. 79, 442 (Dec. 19, 2000).

[164] U.S. Country Profile, *supra* note 152.

[165] *Id.* Some commentators have identified the problems with risk benefit analysis, particularly given the risk of agency capture. These problems might indicate that the incorporation of the economics from the point of industry might run counter to the mandate of the Rio Declaration and Agenda 21. For example, Danica Li notes that farmworkers, who health is at risk from Azinphos-methyl because the cost to industry outweighed in the EPA's consideration the toxic impacts to those most exposed to the insecticide. Danica Li, *Toxic Spring: The Capriciousness of Cost-Benefit Analysis Under FIFRA's Pesticide Registration Process and Its Effect on Farmworkers*, 103 CAL. L. REV. 1405, 1428–32 (2015).

[166] The one case located that explicitly mentions Agenda 21 is Barnes v. Obama, No. 16-2299-JAR-GEB, 2016 U.S. Dist. LEXIS 91184 *2 (D. Kan. June 13, 2016) (dismissing for failure to state a claim a suit where the plaintiff accuses the state of Kansas and the federal government of pursuing a "'Reptilian Agenda' he calls 'Agenda 21'"). Agenda 21 is not a treaty and was therefore not enacted into legislation. However,

3. Zambia's Ten-Year Report

Zambia's report resembles India's more than it does that of the United States because it focuses on bringing environmental issues into discussions of development, rather than balancing environmental, social, and economic considerations. The report identifies high-level bodies tasked with identifying policy approaches and formulating advice to facilitate integration of environmental and other considerations. A central body is the Ministry of Tourism, Environment and Natural Resources, created in 2002 "to provide an environmental policy framework, monitor, evaluate and co-ordinate its implementation, to ensure protection of the environment and sustainable development, management and utilization of natural resources for the benefit of the present and future generations."[167] The Ministry acts to coordinate national environmental programs and activities, as well as the statutory bodies dealing with environmental issues.[168] The Environmental Council of Zambia ("ECZ"), created by an Act of Parliament in 1994, serves as an advisor to the government regarding the environment.[169]

Zambia's 194 National Environmental Action Plan is key to the mandate of Agenda 21. This plan provides guidance for addressing environmental degradation in the country through the integration of environmental concerns in decision-making.[170] The government-sector ministries had generally been in charge of addressing environmental issues, but at the time of the report, the government was evaluating environmental legislation to determine whether statutes facilitated sustainable development

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international legal principles and practice can be influential in judicial decisions. *See*, *e.g*. Adam Liptak, *Justice Breyer Sees Value in a Global View of Law*, N.Y. TIMES (Sept. 12, 2015), https://www.nytimes.com/2015/.09/13/us/politics/justice-breyer-sees-value-in-a-global-view-of-law.html.

[167] U.N., Zambia Country Profile, Johannesburg Summit 2002, at 24 (2002), http://www.un.org/esa/agenda21/natlinfo/wssd/551ambia.pdf [hereinafter Zambia Country Profile]. The Ministry of Tourism, Environment and Natural Resources was created through the merger of the Ministries of Tourism and Environment and Natural Resources. *See also* Nat'l CHM for the Republic of Zambia, Ministry of Tourism, Env't and Nat. Res., Convention on Biological Diversity, http://www.biodiv.be/551ambia/implementation/competent-institutions-and-national-authorities/mtenr (last visited Dec. 18, 2017).

[168] Zambia Country Profile, *supra* note 167.

[169] *Id.* The Act creating the Council was the Environmental Protection and Pollution Control Act (EPPCA) and the focus of its legislative activities involves controlling pollution to protect human health and welfare. Nat'l CHM for the Republic of Zambia, Envtl. Council of Zambia, Convention on Biological Diversity, http://zm.chm-cbd.net/implementation/competent-institutions-and-national-authorities/statutory-bodies-under-mtenr/ecz (last visited Dec. 12, 2017).

[170] Zambia Country Profile, *supra* note 167 at 25. The principles guiding the NEAP are akin to those expressed in Agenda 21, "[t]he right of citizens to a clean and healthy environment. Local community and private sector participation in natural resources management. Obligatory Environmental Impact Assessments of major development projects in all sectors." Nat'l CHM for the Republic of Zambia, *supra* note 169.

considerations.[171] The report identifies several acts of legislation, such as the Pollution Control Act of 1990 and the Forests Act of 1999, addressing issues relevant to the environment.[172]

Zambia's report identifies several sectoral development programs as important in its decision-making framework.[173] Sectoral development programs aim to support reducing poverty through an increase in economic growth at the local level. They tend to involve a variety of public and private entities focused on expanding development. An example of such a sectoral development program is the Environmental Support Program that, with the World Bank's support, is tasked with bringing environmental concerns to the government's Strategy of Poverty Reduction.

Ultimately, according to the report, "[t]he challenge . . . remains to translate the policy provisions [of the National Environmental Action Plan and various other Legislative Acts] into reality."[174] This translation is identified as dependent on getting local communities involved and garnering sufficient funding for activities from groups such as the United States Agency for International Development, the United Nations Development Program, the Food and Agricultural Organization of the United Nations, the Finnish International Development Agency, and the Netherlands Government.[175]

Similar to the United States, and unlike India, Zambia does not include the judiciary in its report on the integration of sustainable development in various national structures involved in decision-making.

4. Summary of Reports and Analysis of Reporting

The reports differ among the parties in part because the concept of sustainable development in Agenda 21 is multifaceted. In particular, Zambia and India, the two developing countries, primarily reported on legal and political avenues for incorporating environmental considerations into decisions about development. Both included an extensive list of political bodies, legislative acts, and agency regulations, and, in the case of India, judicial opinions. In contrast, the United States reported on political and legal

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[171] Zambia Country Profile, *supra* note 167 at 24.
[172] *Id.*
[173] *Id.* at 25.
[174] *Id.* at 73.
[175] *Id.*

avenues that facilitate weighing the environment versus economics in making decisions. Its report includes fewer examples of political and legal actions and does not incorporate laws and regulations that mandate consideration of the environment (for example, the Endangered Species Act). While neither India nor the United States report on actions conditioned on external funding, a large section of Zambia's report lists several sectoral development programs that need aid from non-governmental organizations ("NGO's") and other countries.

In addition to individual country reports, the CSD made public three reports arising from a study of the reporting experience itself.[176] Since Chapters 8 and 38 of Agenda 21 focus on the reporting aspect, this analysis is useful to evaluate the effectiveness of these sections of Agenda 21. By 2002, 124 countries reported to the CSD, and their profiles were posted to the Sustainable Development Website.[177] This resulted in increased cooperation between governments, NGOs, and private companies' stakeholders, especially in developing countries.[178] Reporting also helped countries prepare for the annual CSD sessions.[179]

By the time of the analysis, interest and momentum on the part of at least some governments in providing information to the CSD was declining.[180] Comments from twenty-four countries indicated that the process of producing the national reports was valuable in supporting government assessment and stimulation of sustainable development progress.[181] Problems with reporting included the lack of sufficient understanding of the concept of sustainable development.[182]

In sum, a number of parties initially followed the Chapters 8 and 38 reporting and transparency components of Agenda 21. Participants found that this reporting was a useful tool in their engagement with the subsequent

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[176] CSD, Background Paper for the Meeting of National Focal Points on Improving Future National Reporting to the Commission on Sustainable Development at 2 (Feb. 12–13, 2002) (referring to the mandate in Agenda 21 Chapter 38.13 for the CSD to keep track of national implementation of Agenda 21 and evaluate progress based upon national reports).

[177] *Id*. The Sustainable Development Website is at https://sustainabledevelopment.un.org (last visited Dec. 2, 2017). It includes recent country reports and analysis but does not currently host the reports used in this analysis.

[178] CSD, *supra* note 176, at 2.

[179] *Id.* at 7.

[180] *See generally id.* at 4.

[181] *Id*.

[182] *Id.* at 5.

conference. This reporting is a form of "peer-pressure," where involvement in the community of nations drives actions.

According to the report, there were issues with the capacity of countries to report successfully and the consistency of the identification of "sustainable development" by participants. The apparent decline in the engagement of some governments by 2002 also indicates that, while there was some compliance initially, this enthusiasm for reporting risked waning after ten years of implementation.

D. Evaluation of Agenda 21

The effectiveness of international legal agreements can be analyzed from multiple lenses. The more parties that comply with obligatory language, the more "legally effective" the agreement is. Furthermore, the more parties that, as a result of the agreement, shift behavior towards achieving the agreement's goal, the more "behaviorally effective" the agreement is.[183] Finally, the more the actions under the agreement result in solutions to the original problems, the more the agreement exhibits "problem-solving effectiveness."[184]

1. The Legal Effectiveness of Agenda 21

Agenda 21 is not a treaty under the Vienna Convention of the Law of Treaties and does not include legally binding language, for example the term "shall."[185] However, it does include hortatory language such as "should."[186] Thus, "legal compliance" with Chapter 8, and the subsequent 1997 call to produce NSDSs by 2002, is indicated by the extent to which individual nations completed a coherent national review, identified structures and policies to ensure that decision-making at all levels involved consideration of sustainable development, and created a NSDS.

A majority, 122 of 188 parties or 65%, submitted publicly available reports by 2002. This indicates that parties generally complied with Chapter 8 by evaluating national decision-making structures for integration of the

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[183] *See*, BODANSKY ET AL., *supra* note 11, at 253 (identifying various approaches to analyzing effectiveness of agreements); *see also* Raustiala, *supra* note 101, at 393–94.

[184] BODANSKY ET AL., *supra* note 11 at 253.

[185] *See generally Agenda 21*, *supra* 24.

[186] *Id.*

environment and economy in decision-making. It also indicates broad compliance with the suggestion of Chapter 38 to report on this activity.[187] Thus, by the measure of sheer proportionality, at the ten-year mark, Chapters 8 and 38 showed some level of legal effectiveness. Fewer than half of the parties to the plan submitted a NSDS in time for the 2002 World Summit on Sustainable Development—85 of 188 parties, or 45%. Thus, the Chapter 8.7 expectation that all parties create an NDS was less legally effective.

2. The Behavioral Effectiveness of Agenda 21

Identifying the behavioral effectiveness of Chapters 8 and 38 of Agenda 21 involves determining whether the implementation of policies, legal structures, and a NSDS shifted the process of national and subnational decision-making towards ensuring inclusion of sustainable development considerations. While there is no counterfactual world without Agenda 21, it is possible to identify patterns consistent with shifting behavior. The more a country considers sustainable development in its policy goals, the higher the chance it is shifting decision-making behavior.

Agenda 21's goal of shifting governmental behavior to include the environment in decision-making is similar to the goal of NEPA in the United States, the procedural statute influential in the creation of Agenda 21.[188] It is thus useful to evaluate the operation of NEPA as a way to illuminate the behavioral effectiveness of Agenda 21. NEPA requires that an environmental impact analysis be conducted and environmental impact statements be produced by federal agencies prior to committing to a particular project or plan.[189] It is seen as widely successful at forcing agencies to consider (or at least identify) the environmental impact of their plan.[190] However, early on the Supreme Court held that NEPA did not create substantive obligations, only procedural obligations.[191] Some commentators suggest, therefore, NEPA does not compel final decisions to adopt the plan that best balances

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[187] Earth Summit 2002, *National Strategies for Sustainable Development and National Reports*, http://earthsummit2002.org/es/national-resources/nssd.html (last visited Aug. 12, 2017) (hosting National Strategies for Sustainable Development reports).

[188] LYNTON KEITH CALDWELL, THE NATIONAL ENVTL. POL'Y ACT: AN AGENDA FOR THE FUTURE 108 (1998).

[189] 442 U.S.C. § 4332(1)(c)(v).

[190] *See, e.g.*, Environmental Law Institute, *NEPA Success Stories: Celebrating 40 Years of Transparency and Open Government*, (Aug. 2010) (describing NEPA's implementation over four decades).

[191] *See, e.g.*, *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350–51 (1989).

environmental, social, and economic considerations.[192] Despite its apparent lack of substantive obligations, environmental law commentators see NEPA as an important cornerstone of United States environmental policy.[193] Even though NEPA is generally viewed as not imposing substantive requirements, commentators believe it still evidences effectiveness at the behavioral level because it at least forces the issues in front of decision-makers and the public—a necessary first step in norm shifting.[194]

The Chapter 8 review and integration, by necessity, forces each national government to incorporate sustainable development perspectives at least at the point of review and evaluation, similar to the requirements of NEPA. Chapter 38's suggested reporting inserts some potential transparency into the procedure. It therefore, in a way, pressures individual parties to present their evaluations of their own implementation in a manner that accords with the general sustainable development goals of Agenda 21.

Judicially-imposed requirements for agencies to meet the procedures of NEPA ensure that agencies take their NEPA duties seriously or find themselves in court. For Agenda 21, the reviews were in response to a political commitment rather than a legal obligation, and therefore their completion certainly suggests some self-imposed shift in behavior. However, the content of the reports differs drastically, as indicated above in the discussion of the United States, India, and Zambia. It appears first that the parties differed in their interpretation of what structural implementation of sustainable development into decision-making looks like. This is not surprising, given the amorphousness of the agreement.[195] Some, including India and Zambia, interpreted it as a requirement to insert environmental

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[192] Walter A. Rosenbaum, Capacity for Governance: Innovation and the Challenge of the Third Era, *in* THE OXFORD HANDBOOK OF U.S. ENVTL. POL'Y 145–47 (Sheldon Kamieniecki, Michael Kraft eds., 2013) (summarizing the tension between the procedural success and the possible lack of substantive obligations under NEPA); *see also* William H. Rodgers, *NEPA at Twenty: Mimicry and Recruitment in Environmental Law*, 20 ENVTL. L. 485, 500–02 (1990) (describing the loss of substantive obligations under NEPA); Donald N. Zillman and Peggy Gentles, *NEPA's Evolution: the Decline of Substantive Review*, 20 ENVTL. L. 505, 530 (1990) (suggesting that the judiciary pulled the substantive teeth of this statute). *But see* Marion D. Miller, *The National Environmental Policy Act and Judicial Review after Robertson v. Methow Valley Citizens Council and Marsh v. Oregon Natural Resources Council*, 18 ECOLOGY L.Q. 223, 251 (1991) (suggesting that the Supreme Court's anti-substantive readings of NEPA can be interpreted as highly case specific).

[193] Rodgers, *supra* note 192, at 500–02; *see also* Richard Lazarus, *The National Environmental Policy Act in the U.S. Supreme Court: A Reappraisal and a Peek Behind the Curtains*, 100 GEO. L.J. 1507, 1519 (2009) (arguing that, even in attempting to limit NEPA's substantive obligation the Supreme Court created a higher profile for NEPA in decision making and in this way promoted the interests of environmentalists).

[194] *See* e.g. Lazarus, *supra* note 193, at 1519.

[195] Ellie Carroll, *Twenty-Five Years in the Making: Why Sustainable Development Has Eluded the UN, and How Community-Driven Development Offers the Solution,* 32 HOUSTON J. INT'L L. 545, 552 (2010).

considerations into decision-making. Others, such as the United States, viewed it as requiring the balancing of environmental costs against economic benefits.

Further clouding the issue of whether Agenda 21 affected behavior, the reports highlight work towards sustainability regardless of whether the legislation is promulgated directly in response to Agenda 21. Similarly, these reports do not indicate whether a State is actually shifting behavior beyond simply taking the time to prepare the report for the CDS.[196] The reporting indicates that one benefit to reporting countries was continued engagement with Agenda 21. This is similar to the impact of NEPA on parties forced to integrate environmental impacts into analyses prior to decision-making. However, the extensive but broad directives of Agenda 21, with respect to what exactly countries were to consider, makes it possible for the reports to include a number of actions likely not involving any real shift in decision-making processes towards sustainability.[197] Thus, these ten-year reports do indicate some low level of behavioral effectiveness, but are not sufficiently focused to indicate clear shifts in behavior to come into line with the goals of Agenda 21.

More recent behavioral effectiveness can be evaluated based upon the adoption of NSDSs. A number of countries have participated in producing and submitting NSDSs. However, the content of these NSDSs indicates a lower behavioral effectiveness than the numbers alone indicate. While 85 nations (and none of the parties reviewed here) had adopted NSDSs by 2002, by 2010, 106 nations had adopted NSDSs (including India and Zambia, but not the United States) and 10 more nations were in the process of adopting NSDSs.[198] Thus, by 2010, 116 of 172 or 67%, of countries were implementing, or in the process of implementing, NSDSs.[199] This included most European and Asian countries and much of Oceania. Similarly, about

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[196] For example, while the United States cites the PCSD as an important body for furthering executive action in the arena of sustainable development, most of its extensive recommendations, eminently suitable as a basis for a NSDS, were never implemented. Dernbach, *supra* note 125, at 723 (noting that in 2002 "[t]he United States ha[d] no coherent overall strategy for sustainable development . . . .").

[197] For example, the United States reports on the incorporation of cost estimates into the Fungicide, Insecticide, Rodenticide Act as a part of its approach to following Agenda 21. *See* U.S. Country Profile, *supra* note 152. However, rather than increasing sustainable behavior, incorporating cost in this statute tends to undercut environmental protections. *See* Li, *supra* note 165, at 1428–32.

[198] Stakeholder Forum for Sustainable Development, Detailed Review of implementation of Agenda 21 48–49 (Jan. 2012) [hereinafter Stakeholder Forum].

[199] *Id*.; *see also* Cicero Lucena & John Gummer, *Why Rio failed in the past and how it can succeed this time*, GUARDIAN (June 12, 2012) https://www.theguardian.com/environment/2012/jun/12/rio20-agenda-politicians-john-gummer (last visited Nov. 11, 2017) (noting that 172 parties signed on to the plan).

one-third to one-half of South and Central American and African countries were either implementing their NSDSs, developing an NSDS, or implementing some sustainability components nationwide.[200] The other countries had not reported on the progress of their NSDSs.[201] Most of the Middle East was unreported, and North America ranged from implementing (Mexico), in progress (Canada), to no NSDS (United States).[202]

Even in those countries implementing NSDSs, the process is in its infancy.[203] Thus, while the submission and implementation of NSDSs indicates a more specific mode of compliance with the expectations of Agenda 21 than the reports themselves, they do not demonstrate a full shift to a sustainable development approach. There is some indication of behavioral effectiveness as some parties have shifted their behavior to actually create NSDSs. However, the form of these NSDSs is less thorough than anticipated by Agenda 21, and thus any behavioral effectiveness is moderate.

3. The Problem-Solving Effectiveness of Agenda 21

The problem-solving effectiveness of Agenda 21 can be evaluated based on both narrow and broad goals. Narrowly, Chapters 8 and 38 of Agenda 21 aimed to compel parties to incorporate sustainable development into decision-making structures and to report on this incorporation, as well as on the NSDS, to the CSD. More broadly, Agenda 21 sought to solve the problem of negative environmental impacts from development and the increasing rate of global poverty.[204] While Agenda 21 experienced some problem-solving effectiveness in its narrower goals by affecting decision-making structures, it was not effective at solving the large-scale problems of development, the environment, and global poverty.

As indicated above, 67% of parties submitted reports to the ten-year conference. This indicates that Agenda 21 was somewhat effective at forcing parties to review their own activities and implement national strategies and

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[200] Stakeholder Forum, *supra* note 198, at 48–49, Fig.1; *see, e.g.*, P. Chitundu-Musonda, *The National Strategy for Sustainable Development Process in Zambia*, UNECA (Nov. 2007), http://www1.uneca.org/Portals/rio20/documents/Workshop-Institutional-StrategicFrameworks/CountryReports/NSSD%20Zambia%20Nov%202007.pdf (reporting on Zambia's progress in implementing an NSDS).

[201] Stakeholder Forum, *supra* note 198, at 48–49, Fig.1.

[202] *Id.*

[203] *Id.*

[204] *Id.* at 1. The ultimate goals included "improve[ment of] the living standard of those in need; better manag[ment] and protect[ion of] the ecosystem; and . . . a more prosperous future for all."

other policies to ensure that decision-making includes sustainable development considerations. However, even twenty years later, not all parties have reported whether they intend to create NSDSs, and countries such as the United States indicate that they do not plan to submit one. Furthermore, according to the United Nations' own 2012 report, "in practice . . . most nations are still only at the early stages of implementing strategies" that "offer an integrated and participatory system to develop visions, goals and targets for sustainable development, and to coordinate implementation and review."[205] Thus, while behavioral compliance with the evaluation and reporting components of Chapters 8 and 38 were relatively effective, the ultimate goal of changing behavior and creating a norm of integrating sustainable development into the decision-making level appears far less effective.

Agenda 21 appears to have failed to achieve some of its broader goals, such as those to eliminate global poverty and environmental degradation caused by development.[206] Since the implementation of Agenda 21, the number of people experiencing poverty has increased, and instability and climate shifts have decreased the average standard of living.[207] While the lack of a counterfactual world, one without Agenda 21, makes it difficult to assess the plan's impact on poverty, it is interesting that, following the 2000 inception of the Millennium Development Goals, the percentage of the world's population experiencing extreme poverty dropped measurably.[208] Furthermore, rates of consumption continue to be unsustainable and natural resource depletion continues apace.[209] Specific measures evaluated in the United Nations twenty-year report, such as the rate of increase in the number

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[205] *Id.* at 48.

[206] U.N. DIV. FOR SUSTAINABLE DEV., BACK TO OUR COMMON FUTURE: SUSTAINABLE DEVELOPMENT IN THE 21ST CENTURY PROJECT, SUMMARY FOR POLICYMAKERS (2012), stating that "[t]he political deal that emerged from the Earth Summit in 1992 has, for various reasons, never been fulfilled. Neither the expected outcomes—elimination of poverty, reduction in disparities in standard of living, patterns of consumption and production that are compatible with the carrying capacity of ecosystems, sustainable management of renewable resources—nor the agreed means to achieve them, have materialized.") [hereinafter BACK TO OUR COMMON FUTURE].

[207] Stakeholder Forum for Sustainable Development, Review of Implementation of Agenda 21 and the Rio Principles 7 (Jan. 2012) [hereinafter Stakeholder Forum of Agenda 21 and the Rio Principles]; *see also* UNHCR, Climate Change and Disasters, http://www.unhcr.org/en-us/climate-change-and-disasters.html (last visited Nov. 6, 2017) (noting that harmful impacts from climate change continue currently).

[208] *See, e.g.*, *The world has made great progress in eradicating extreme poverty*, ECONOMIST, March 30, 2017, https://www.economist.com/news/international/21719790-going-will-be-much-harder-now-world-has-made-great-progress.

[209] Stakeholder Forum of Agenda 21 and the Rio Principles, *supra* note 207, at 7; BACK TO OUR COMMON FUTURE, *supra* note 206, at 3–4, Fig 3 (showing steady increases in global material use and energy consumption over 100—150 years including the two decades since Agenda 21 and the Rio Conference).

of undernourished people and CO_2 emissions and the resilience of fish stocks, were determined to be "moving in the wrong direction."[210]

However, the framework of Agenda 21 might not be the culprit.[211] Rather, the assumptions underlying the framework—the idea that technology would help address the tensions between development and the environment—appear to have been misplaced.[212] The goals, in their ambition, might have doomed Agenda 21. It is possible that they "constituted a challenge that [c]ould not be met."[213] Further, the very "idea that both the environment and development can be accommodated within a single paradigm may be [fundamentally] contradictory."[214] Finally, "sustainable development" itself may be the problem because it is "not about giving priority to environmental concerns, but rather, it is about incorporating environmental assets into the economic system to ensure the sustainability of the economic system."[215] Rather than recognizing that environmental and social issues cannot be constrained to predictable, efficiency-driven frameworks, sustainable development, and Agenda 21 rest on the assumption that issues across the board can be fit to allow for the most efficient economic growth, thus benefitting all.[216]

Agenda 21 did not eliminate global poverty, nor did it result in a cleaner environment.[217] In 2012, twenty years after its inception, the United Nations Assembly officially moved away from the global framework developed in Agenda 21.[218] Nonetheless, the international community continues to work towards sustainable development, and in September 2015, world leaders committed themselves to an ambitious global agenda—"Transforming our

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[210] BACK TO OUR COMMON FUTURE, *supra* note 206, at 1, 2, Fig. 1, 2.

[211] *Id.* at ii (noting "[o]pinions may differ on whether our current framework for action was never fully put to the test due to lack of political will or whether it was insufficient to succeed. The fact is that we have not succeeded.").

[212] *Id.* at 4.

[213] Geoffrey Palmer, *What Went Wrong at Rio?*, 70 WASH. U. L. R. 1005, 1013 (1992).

[214] Geoffrey Palmer, *Setting the Scene for the "New Thinking on Sustainability" Conference*, 13 N.Z. J. OF PUBLIC & INT'L. L. 17, 19 (2014).

[215] Timothy Doyle, *Sustainable Development and Agenda 21: The Secular Bible of Global Free Markets and Puralist Democracy*, 19 THIRD WORLD Q. 771, 774 (1998) (quoting S. BEDER, SUSTAINABLE DEV. 8 (1994)).

[216] *Id.* at 775.

[217] Stakeholder Forum of Agenda 21 and the Rio Principles, *supra* note 207, at 7; BACK TO OUR COMMON FUTURE, *supra* note 206, at 3–4, Fig 3.

[218] General Assembly Res. 67/203 2012 Implementation of Agenda 21, Programme for the Further Implementation of Agenda 21 and the Outcomes of the World Summit on Sustainable Development and of the United Nations Conference on Sustainable Development (Dec. 21, 2012), http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/67/203.

world: the 2030 Agenda for Sustainable Development."[219] Furthermore, the Rio+20 Conference resulted in the initiative that produced the United Nations Sustainable Development Knowledge Platform, an information hub, and gathering of all commitments to furthering sustainable development goals.[220] This platform has served to collect a variety of commitments to sustainable development that respond to various international agreements (such as Agenda 21) and other initiatives.[221] The world community continues to at least talk about sustainable development, and in this way, Agenda 21 made a mark.

IV. THE CLIMATE CHANGE PROCESS LEADING TO THE PARIS AGREEMENT AND ITS STRUCTURE

The Paris Agreement is the most recent international climate change treaty. It follows on the Kyoto Protocol and is similarly encompassed within the framework of the UNFCCC. Below, the international climate change regime and development of the Paris Agreement are introduced. This is followed by a summary of the legal structure of the Paris Agreement with a focus on the Article 4's NDC reporting requirement and Article 13's transparency mechanism. Finally, article explores implications of the current NDCs on the ultimate goal of the Paris Agreement.

A. The Context of International Climate Change Discussions

The UNFCCC was produced at the same time as Agenda 21. As of today, 197 countries are party to the Convention, including the United States and China.[222] Unlike Agenda 21, however, it is a treaty that is focused solely on climate change. It creates the structure for governance over the international climate regime, providing the authority for the adoption of both the Kyoto Protocol and the Paris Agreement.[223] It is a general framework

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[219] *Transforming our world: the 2030 Agenda for Sustainable Development*, U. N., https://sustainabledevelopment.un.org/post2015/transformingourworld (last visited Feb. 2, 2018).

[220] *Sustainable Development Knowledge Platform*, U.N., https://sustainabledevelopment.un.org/ (last visited Nov. 5, 2017). This initiative was the result of State and NGO pressure in the preparations for the Rio+20 Conference. Edith Brown Weiss, *Voluntary Commitments as Emerging Instruments in International Environmental Law*, 44 ENVTL. POL'Y & L. 83, 87 (2014).

[221] *Sustainable Development Knowledge Platform, supra* note 220.

[222] *See Climate Change*, U.N., http://unfccc.int/parties_and_observers/parties/items/2352.php (last visited Dec. 10, 2017) (listing parties to the UNFCCC).

[223] *See* BODANSKY ET AL., *supra* note 11, at 119. Since they both were adopted under the UNFCCC, they are the type of "associated legal instrument" that incorporate aspects of the UNFCCC. *Id.* at 212. The Paris Agreement also explicitly mentions furthering the goals of the UNFCCC as a purpose in Article 2 thus firmly ensconcing the Paris Agreement as a component of the global climate agreement framework. *Id*.

further fleshed out by the results of conferences of the parties ("COPs") where more specific agreements are generated.[224]

The first treaty enacted under the UNFCCC was the Kyoto Protocol, which was adopted in 1997. The Protocol is top-down, with legally binding emissions caps for each developed country and a compliance system.[225] Developing countries, including China and India, are not bound by these objectives. As a result of the treaty's ultimate failure to reach the United States and Canada, who are not parties to the treaty, as well as China, and India, who, as developing countries, are not under obligation to limit emissions under the treaty, it impacts only 24% of current global emissions. As such, it is insufficient to address climate change.[226] The bottom-up structure of the Paris Agreement is a response, to some extent, to the Kyoto Protocol's lack of problem solving efficiency.

The structure of the Paris Agreement was developed by the parties to the UNFCCC over time. Prior to the Conference of the Parties in Paris at the end of 2015, an ad hoc working group met numerous times. The group decided that the Agreement would have a hybrid structure, with both top-down, but nonbinding, and bottom-up, but binding, components. In particular, the group sketched out the NDCs' procedural requirement and called for countries to submit their Intended Nationally Determined Contributions ("INDCs")[227] prior to the Paris Conference.[228] The negotiators focused on producing an agreement that was transparent, rendered the parties accountable, and included a mechanism for parties to update their efforts to mitigate climate change over the life of the agreement.[229]

On December 15, 2015, the twenty-first Conference of the Parties resulted in the Paris Agreement. It was hailed by United Nations Secretary General Ban Ki-moon as a "monumental triumph."[230] The victory was a

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[224] *Id.* at 142; *see also* Paris Agreement art. 1.

[225] BODANSKY ET AL., *supra* note 11, at 105.

[226] *Id*. at 108.

[227] Parties submit intended nationally determined contributions (INDCs) prior to ratification or acceptance of the Agreement, for example, prior to the Paris COP. When the party formally ratifies or accepts the agreement, it also submits its NDC which is then recorded in the registry. *See Paris Climate Agreement Q&A*, POL'Y HUB INT'L, https://www.c2es.org/content/paris-climate-agreement-qa/ (last visited Dec. 14, 2017).

[228] *See* BODANSKY ET AL., *supra* note 11, at 115.

[229] *Id*. at 215.

[230] *U.N. Chief Hails New Climate Change Agreement as "monumental triumph*," U.N., http://www.un.org/sustainabledevelopment/blog/2015/12/un-chief-hails-new-climate-change-agreement-as-monumental-triumph/ (last visited Dec. 23, 2017).

widely adopted multilateral environmental treaty, an agreement by nearly all of the nations of the world to attack the "super wicked" "global commons" problem of climate change. Via "unprecedented political will" the negotiations resulted in a "long-term, balanced and virtually universally accepted agreement, despite the many crisscrossing red lines of parties."[231]

However, the "victory" of the Paris Agreement did not result in guaranteed emissions caps that could solve the problem of climate change. At the point the Agreement was adopted, the INDCs submitted to the conference indicated that the Agreement would result in an estimated 2.6–3.1°C increase in global mean temperature over the next century.[232] This is a reduction from the "business as usual" emissions trajectory predicted to result in a 4.0°C or higher increase.[233] It, however, does not meet the Agreement's goal of a maximum increase of 1.5°C.[234] Further, it does not even meet the 2.0°C maximum increase once considered by some to be a "guardrail" for preventing massive climate destabilization through massive positive feedback.[235]

B. Legal Structure of the Paris Agreement

The Paris Agreement is comprised of a total of twenty-nine articles amounting to twenty-five pages in length in its English translation. The relatively short length belies the fact that it sufficiently satisfied the widely divergent concerns of negotiating parties such that, as of December 2017, all nations of the world are signatories.[236] Its economy of language also hides the complexity of its legal structure. It contains binding obligations, such as the requirement to submit an NDC. It does not bind parties to actually achieve

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[231] BODANSKY ET AL., *supra* note 11, at 209.

[232] Joeri Rogelj et al., *Paris Agreement climate proposals need a boost to keep warming well below 2 °C,* 534 NATURE 631, 631 (2016).

[233] *New Report Examines Risks of 4 Degree Hotter World by End of Century*, WORLD BANK PRESS RELEASE (Nov. 18, 2012), http://www.worldbank.org/en/news/press-release/2012/11/18/new-report-examines-risks-of-degree-hotter-world-by-end-of-century.

[234] Paris Agreement, *supra* note 14, at art. 2 (identifies the broad goal of "pursu[ing] efforts" to keep temperature increase at or below 1.5.").

[235] Lisa Friedman, *Little Chance to Restrain Global Warming to 2 Degrees, Critic Argues*, SCIENTIFIC AM. (May 7, 2015), https://www.scientificamerican.com/article/little-chance-to-restrain-global-warming-to-2-degrees-critic-argues/. *See also* Hansen et al., *supra* note 37, at 7, 15 (indicating that any mean temperature increase above 1.0°C risks catastrophic positive feedback loops).

[236] *See, e.g.*, Fiona Harvey, *Paris climate change agreement: the world's greatest diplomatic success*, GUARDIAN (Dec. 14, 2015), https://www.theguardian.com/environment/2015/dec/13/paris-climate-deal-cop-diplomacy-developing-united-nations (discussing the conflicts and complexity of negotiations running right up to the point of agreement). Despite President Trump's announcement that the U.S. intends to withdraw, under the terms of the treaty, it remains a party until 2020. Paris Agreement, *supra* note 14, at art. 28. Syria and Nicaragua, the holdouts, joined in late 2017.

the NDCs they submit. However, it does also incorporate the expectation that parties will, over time, submit increasingly ambitious NDCs.[237] The Agreement further contains recommendations, encouragement, aspirations and understandings.

The result is a treaty that primarily obliges parties to report national targets, and to share information about state action and methods of emission reduction. However, it does not bind the parties to particular outcomes.[238] Instead, it aims at compliance as a result of "peer-pressure," rather than a top-down enforcement mechanism, similar to Agenda 21.[239] The peer-pressure arises because the core obligatory language involves the NDC mitigation mechanism of Article 4 combined with the transparency requirements of Article 13 and the global stocktake of Article 14.[240] Other binding language requires information sharing, aspects of general financing, technology sharing, and aspects of adaptation.[241]

The Article 4 NDC mechanism is reminiscent of Agenda 21's Chapter 8 because it allows parties to identify their own targets. Unlike Agenda 21, however, Article 4 of the Paris Agreement includes the word "shall." In contrast to "should," the strongest language of Agenda 21, "shall" obliges parties more than the recommending "should" or expecting "will." Article 4(2) is the article in which parties are legally required to identify NDCs. It states that "[e]ach party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve." This section further compels the parties to attempt to mitigate the effects of climate change in an effort to reach these NDCs, stating that "parties shall pursue domestic mitigation measures with the aim of achieving the objectives of such contributions."[242] This clause creates an obligation of conduct for each party to produce and report on its NDC, and is reflective of Agenda 21's

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[237] BODANSKY ET AL., *supra* note 11, at 226–48.

[238] The Paris Agreement, in contrast, is a treaty under the VCLT. "'Treaty' means an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation." VCLT, *supra* note 25, at art. 2(a).

[239] *See* Fernanda Ferreira, *Paris Climate Agreement: An important moral victory with the potential for greatness*, SCI. IN THE NEWS (Dec. 20, 2015), http://sitn.hms.harvard.edu/flash/2015/paris-climate-agreement-an-important-moral-victory-with-the-potential-for-greatness/.

[240] Paris Agreement, *supra* note 14, at arts. 4, 13–14; *see also*, BODANSKY ET AL., *supra* note 11, at 231 (noting that Art. 4 identifies "[t]he most significant legal obligations" of the Agreement).

[241] *See, e.g.*, Paris Agreement, *supra* note 14, at art. 9(7), (indicating that "[d]eveloped country parties shall provide transparent and consistent information on support for developing country parties") and art. 10(6) (stating that "[s]upport, including financial support, shall be provided to developing country parties").

[242] *Id.* art. 4(2).

recommendation that parties act to integrate sustainable development into decision-making.[243]

Article 4(9) requires that parties "communicate a nationally determined contribution every five years." However, it leaves the specifics of the reporting mechanism to be determined in future conferences. Subsequent NDCs "will represent a progression beyond the Party's then current nationally determined contribution."[244] Parties are also obligated to account for the "anthropogenic emissions and removals" that correspond to their NDCs.[245] Recommended characteristics of this accounting include "transparency, accuracy, completeness, comparability and consistency, and . . . avoidance of double counting."[246] Art 4(12) requires NDS to be "recorded in a public registry maintained by the secretariat."

Article 13 outlines the transparency mechanism and includes information arising out of Article 4. It requires parties to submit reports of national inventories of "anthropogenic emissions by sources and removals by sinks of greenhouse gases" and "[i]nformation necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4."[247] Finally, the information included in the transparency mechanism will be reviewed in a "global stocktake in 2023 and every five years thereafter."[248] The stocktake is a collective assessment by the parties of current progress and means by which targets may be increased in ambition to better attack the problem of climate change.[249] This stocktake will help to "inform Parties in updating and enhancing, in a nationally determined manner, [their actions] in a nationally determined manner."[250]

The five-year reporting cycle, the periodic stocktakes, and the general expectation that the "efforts of all parties will represent a progression over time" enumerated in Articles 3 and 14 are part of the ambition cycle which aims to progressively reduce emissions over time. Because the NDCs

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[243] BODANSKY ET AL., *supra* note 11, at 231.

[244] Paris Agreement, *supra* note 14, at art. 4(3); *see also* art. 4(11) (noting that a "Party may at any time adjust its existing nationally determined contribution with a view to enhancing its level of ambition").

[245] *Id*. art. 4(13).

[246] *Id.*

[247] *Id* art. 13(7)(a)(b).

[248] *Id.* art. 4(a).

[249] Eliza Northrop, Cynthia Elliott & Melisa Kmjaic*, Insider: 4 Key Questions for the Design of the Global Stocktake*, WORLD RESOURCES INST. (May 19, 2016), http://www.wri.org/blog/2016/05/insider-4-key-questions-design-global-stocktake.

[250] Paris Agreement, *supra* note 14, at art. 14(3).

submitted before the Paris Meeting failed to reduce emissions enough to prevent catastrophic effects, the final agreement needed to provide a mechanism to increase the ambition of NDCs in order to ramp down emissions over time.[251]

Agenda 21 does not require a public database, but the Commission for Sustainable Development does make reports publically available. Underlying this policy of making reports public is the understanding that the risk of international embarrassment theoretically results in parties feeling bound to comply with the purpose of an instrument (sustainable development nationally considered and reduction in emissions to reach the 1.5 °C target), despite the lack of a clear legal obligation. Even in the absence of legally binding, enforceable targets, the Paris Agreement provides a focus for nations to identify parties out of compliance and penalize them through sanctions or other means.[252] The Agreement does not require that parties reach their NDCs. However, it was negotiated under the assumption of *pacta sunt survanda*—that parties would act in "good faith" as required by the Vienna Convention on the Law of Treaties Article 26.[253]

C. The Current State of the Paris Agreement

The Paris Agreement officially entered into force on November 4, 2016, thirty days after a sufficient number of parties who account for at least 55% of global emissions submitted "instruments of ratification, acceptance, approval or accession."[254] To date, 174 of 197 signatories (88%) have ratified the Agreement.[255] In October 2017, Nicaragua announced it was ratifying the Agreement, and on November 7, 2017, Syria ratified as well.[256] Parties have

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[251] BODANSKY ET AL., *supra* note 11, at 235.

[252] While the Agreement itself does not include sanctions as an enforcement measure, parties can choose to impose sanctions in response to perceived violations. *See*, *e.g.*, Coral Davenport, *Diplomats Confront New Threat to Paris Climate Pact: Donald Trump*, N.Y. TIMES (Nov. 18, 2016), https://www.nytimes.com/2016/11/19/us/politics/trump-climate-change.html.

[253] Bodansky, *supra* note 13, at 145.

[254] Paris Agreement, *supra* note 14, at art. 20(1).

[255] *See The Paris Agreement,* U.N., http://unfccc.int/paris_agreement/items/9485.php (last visited Feb.3, 2018) (tracking ratification).

[256] *See* Lisa Friedman, *Syria Joins Paris Climate Accord, Leaving Only U.S. Opposed*, N. Y. TIMES (Nov. 11, 2017), https://www.nytimes.com/2017/11/07/climate/syria-joins-paris-agreement.html (indicating that Syria is now a party to the Agreement); Liam Stack, *Only U.S. and Syria Now Oppose Paris Climate Deal, as Nicaragua Joins*, N. Y. TIMES (Oct. 24, 2017), https://www.nytimes.com/2017/10/24/world/americas/nicaragua-paris-climate-agreement-us.html?_r=0 (describing Nicaragua's decision to join the Agreement and indicating that Nicaragua initially refused to sign because it viewed the Agreement as "insufficiently ambitious").

continued submitting NDCs following the adoption of the Agreement. To date, 167 signatories (85%) have submitted NDCs.[257]

The form of the NDCs include quantitative targets, qualitative approaches, and both unconditional and conditional goals.[258] For example, the United States NDC target, submitted by the Obama administration, is limited to a reduction of emissions by 26%–28% below its 2005 levels by 2025. India's target is for a range of years, 2021–2030, and includes qualitative targets such as sustainability and the adoption of a "climate friendly and a cleaner path" to development.[259] India also incorporates quantitative targets, such as a reduction in gross domestic product emissions by 2030 of 33–35% below its 2005 levels, and an increase in sequestration of 2.5 to 3 billion tons of CO_2.[260] Zambia's NDC target is an emission reduction of 47% below its 2010 levels, and is conditioned upon obtaining sufficient funds, to support developing alternative energy resources, both internally (approximately $15 billion) and from other nations ($35 billion).[261]

The brevity of the Paris Agreement is an indication of its lack of procedural specificity and the extent to which details, such as how to ensure the transparency of parties' actions, are omitted.[262] This simplicity facilitated its success in drawing in parties, although it also requires parties continue to return to the table at subsequent meetings and Conferences to hammer out the specifics. The first Conference following the adoption of the Paris Agreement was the 2016 "COP of Action," in Marrakech.[263] At COP 22, signatories continued to discuss the specifics of the mechanisms, but decided to wait until 2018 to finalize details, such as the creation of a "rulebook" to allow for evaluation, features to be included in NDCs, and other aspects of

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[257] NDC REGISTRY, http://www4.unfccc.int/ndcregistry/Pages/Home.aspx (last visited Feb. 2, 2018).

[258] *See* BODANSKY ET AL., *supra* note 11, at 232.

[259] *See India*, CLIMATE WATCH, https://www.climatewatchdata.org/ndcs/country/IND (last visited Dec. 16, 2017) (presenting India's NDC submission).

[260] *Id.*

[261] *See Zambia*, CLIMATE WATCH, https://www.climatewatchdata.org/ndcs/country/ZMB (last visited Dec. 16, 2017) (presenting Zambia's NDC submission).

[262] *See*, *e.g.*, Sophie Yeo, *COP22: Key outcomes agreed at the United Nations climate talks in Marrakech*, CARBON BRIEF (Nov. 19, 2016), https://www.carbonbrief.org/cop22-key-outcomes-agreed-at-un-climate-talks-in-marrakech (indicating that the variety of components to the Agreement lacking procedural and substantive detail will be clarified at the upcoming 2018 meeting, including how to ensure the transparency of the NDC mechanism).

[263] Solange Cuadros, *Was COP 22 a COP of action?* DUKE TO UNFCCC (Dec. 5, 2016) https://sites.duke.edu/duketotheunfccc/2016/12/05/was-cop-22-a-cop-of-action/ (describing COP 22 as a "cop of protection" rather than the COP of Action that was its name).

transparency.[264] The parties at Marrakech recognized the shortcomings of the NDCs, "call[ing] for urgently raising ambition and strengthening cooperation amongst ourselves to close the gap between current emissions trajectories and the pathway needed to meet the long-term temperature goals of the Paris Agreement."[265]

On November 6, 2017, COP23 opened in Bonn, Germany.[266] Its goals included "launching nations towards the next level of ambition needed to tackle global warming and put the world on a safer and more prosperous development path."[267] Outcomes of this conference included finalized plans for the Talanoa Facultative Dialogue, scheduled for December 2018 in Katowice, Poland.[268] The mandate of this dialogue is an initial stocktake of progress.[269] One aspiration for this meeting is to increase the ambition of the NDCs to bring the parties closer to the reductions necessary to effectively mitigate climate change.[270]

In May 2017, six months before COP23 in Bonn, the President of the United States, Donald Trump, announced his intention to withdraw from the agreement.[271] His early talk of pulling out of the Agreement led other parties to suggest they will impose sanctions.[272] No sanctions have been imposed yet, although there is general condemnation of the decision.[273] At the Bonn

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[264] Yeo, *supra* note 262 (describing the primary outcomes of COP22); Chris Mooney, *Steps to address climate change are "irreversible," world leaders declare in Marrakech*, WASH. POST (Nov. 18, 2016), https://www.washingtonpost.com/news/energy-environment/wp/2016/11/18/paris-accord-nations-resolve-to-push-ahead-on-climate-change-goals-with-or-without-the-u-s/?utm_term=.0916f13ca4dc (describing calls by parties at the Marrakech conference for unity in combating climate change).

[265] U.N. Framework Convention on Climate Change, *Marrakech Action Proclamation for our Climate and Sustainable Development*, U.N. Doc. 2-24/CP.7 (Jan. 21, 2002).

[266] U.N. Climate Change Conference 2017 Aims for Further, Faster Ambition Together, U.N. PRESS RELEASE (Nov. 5, 2017), https://cop23.unfccc.int/news/un-climate-change-conference-2017-aims-for-further-faster-ambition-together.

[267] *Id.*

[268] *2018 Talanoa Dialogue*, U.N., http://unfccc.int/items/10265.php (last visited Dec. 19, 2017).

[269] *Id.*

[270] *See*, Joshua Busby, *3 things we learned at this week's UN climate change meeting*, WASH. POST (Nov. 17, 2017), https://www.washingtonpost.com/news/monkey-cage/wp/2017/11/17/what-did-we-just-learn-at-the-u-n-climate-change-meeting/?utm_term=.44bfd42bb56a (indicating the intent to push for more ambitious NDCs at the Talanoa stocktake).

[271] Michael D. Shear, *Trump Will Withdraw U.S. From Paris Climate Agreement*, N. Y. TIMES (June 1, 2017), https://www.nytimes.com/2017/06/01/climate/trump-paris-climate-agreement.html?mcubz=0.

[272] Kate Birminghan Bontekoe, *What Will a Trump Administration mean for International Agreements with the United States?*, EJIL TALKS (Dec. 13, 2016), http://www.ejiltalk.org/what-will-a-trump-administration-mean-for-international-agreements-with-the-united-states/.

[273] *See, e.g.*, Adam Taylor, *North Korea slams Trump's decision to pull out of Paris accord as "the height of egotism,"* WASH. POST (June 7, 2018), https://www.washingtonpost.com/news/worldviews/wp/2017/06/07/north-korea-slams-trumps-decision-to-pull-out-of-paris-accord-as-the-height-of-egotism/?utm_

Conference in November 2017, the team sent by the Trump Administration to push for increased use of fossil fuels was met with opposition by the rest of the parties at the conference, which was augmented by a shadow United States delegation of leaders from states, cities, and the private sector.[274]

Given that Article 28 of the Agreement does not allow parties to withdraw until four years after it goes into force, on November 4, 2020, parties may be waiting in part to see whether President Trump follows through on his threat.[275] However, it is clear from the proceedings at the Bonn Conference that, while the United States federal administration is acting in bad faith, subnational United States bodies and the rest of the world remain committed to the Agreement, at least for now.[276]

V. CONCLUSION: WHAT DOES AGENDA 21 INDICATE ABOUT THE PROBABLE EFFECTIVENESS OF THE PARIS AGREEMENT?

The NDC reporting requirement is the heart of the Paris Agreement. As such, its effectiveness is a focus of discussions regarding the likely success of the Agreement in terms of climate mitigation. The experience of Agenda 21 indicates a relatively high level of legal effectiveness with this type of bottom-up mechanism, even when sections are not binding, in part because parties respond to peer-pressure in preparation for international conferences.

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term=.c755ee85c4df (quoting North Korea and including a video of other world leaders condemning the decision).

[274] *See* Damian Carrington, *'Tobacco at a cancer summit:' Trump coal push savaged at climate conference*, GUARDIAN (Nov. 13, 2017), https://www.theguardian.com/environment/2017/nov/13/bonn-climate-summit-trump-fossil-fuels-protest (describing the reaction to the Trump delegation as the same as a push for "Tobacco at a cancer summit"); Lisa Friedman, *A Shadow Delegation Stalks the Official U.S. Team at Climate Talks*, N. Y. TIMES (Nov. 11, 2017), https://www.nytimes.com/2017/11/11/climate/un-climate-talks-bonn.html?_r=0 (identifying the "shadow delegation" led by Governor Jerry Brown of California and ex-mayor of New York Michael Bloomberg).

[275] Brad Plumer, *The U.S. Won't Actually Leave the Paris Climate Deal Anytime Soon*, N. Y. TIMES, (Jun., 7, 2017), https://www.nytimes.com/2017/06/07/climate/trump-paris-climate-timeline.html (indicating that the soonest the United States can leave the Agreement is 2020). There appears to be a sense on the part of other governments that President Trump might change his mind. *See, e.g.* Tessa Berenson, *President Trump Tells Emmanuel Macron 'Something could Happen' with Paris Climate Agreement*, TIME (July 14, 2017), http://time.com/4858221/donald-trump-emmanuel-macron-paris-climate-agreement/ (revealing that U. S. President Trump told French President Emmanuel Macron that "something could change about the Paris climate agreement.").

[276] Erik Kirschbaum, *As Trump administration touts coal at UN gathering, U.S. cities and states target climate change*, L.A. TIMES (Nov. 17, 2017), http://beta.latimes.com/world/europe/la-fg-germany-climate-change-20171117-story.html. The U.S. is arguably not a party to the VCLT. *Vienna Convention on the Law of Treaties*, U.S. DEP'T OF STATE, https://www.state.gov/s/l/treaty/faqs/70139.htm (last visited Feb. 3, 2018). However, *pacta sunt servanda* is considered a principle or rule of international law and therefore still binds the U.S. International Judicial Monitor, *supra* note 104.

Agenda 21 was less clearly successful when it came to behavioral effectiveness and, while it saw some narrow problem-solving effectiveness, it failed to broadly solve the problems it sought to address. Thus, while signs of early legal effectiveness of the Paris Agreement are positive, this sort of success is likely insufficient to drive parties to make necessary decisions. The differences between the two will likely serve to determine whether the Paris Agreement is ultimately successful in meeting its broad problem-solving goals.

A. Agenda 21 and the Paris Agreement: Legal, Behavioral, and Problem-Solving Effectiveness

Legal effectiveness with respect to the Paris Agreement Articles 4 and 13 will depend on the likelihood that parties submit NDCs and indicate programs aimed at mitigation to meet these NDCs. In comparison, Agenda 21 demonstrated a strong level of legal effectiveness for Chapters 8 and 38, at least initially, with a 67% reporting rate ten years after the Rio Conference. To date, even more parties are compliant with the Paris Agreement. Two years after the Agreement was produced and one year after taking force, 83% of parties have submitted publicly available NDCs. Agenda 21's success in the reporting arena indicates that this pattern is likely to continue, driven by peer-pressure and the fundamental obligatory language of the Agreement.

Behavioral effectiveness of the Paris Agreement is indicated by parties implementing policies and legal structures supporting the NDC targets that, without this identifiable target, would see "business as usual" action. The most obvious outcome indicating behavioral effectiveness, therefore, is for parties to shift emission trajectories, as a result of policy changes to meet their NDCs. In comparison, Agenda 21 was only moderately successful at shifting behavior. While parties did report on actions towards integrating sustainable development into decision-making processes, these actions were not in clear response to Agenda 21. Furthermore, the specific action of creating and implementing NSDSs appeared insufficiently thorough or robust according to the twenty-year review.[277]

One year after the Paris Agreement entering into force, there are signs that some parties might reach their NDC goals. China, for example, is "set to

[277] *Earth Summit 2002*, NAT'L STRATEGIES FOR SUSTAINABLE DEV. AND NAT'L REP., http://earthsummit2002.org/es/national-resources/nssd.html (last visited Aug. 12, 2017) (hosting National Strategies for Sustainable Development reports).

overachieve its 'peak by 2030 CO_2' goal in its Nationally Determined Contribution (NDC), as well as its own national targets."[278] India is also potentially on track to exceed its target.[279] As of today, however, no industrialized country is on track to meet its NDC.[280] As for the United States, the Trump administration has ceased actively implementing climate change policies and is working towards rolling back curbs on emissions.[281] There is still a chance that the United States will meet its Paris targets, however, since sub-national states and cities, and non-state businesses have committed to ensuring that the country meets upwards of 50% of its NDC by 2025.[282]

If, at the upcoming Talanoa Facilitative Dialogue, the stock-take reveals that parties to the Paris Agreement are likely to meet their NDC targets, the Agreement can be considered, at least in its initial phases, behaviorally effective. While this is not a direct measurement of how countries are behaving in comparison to how they would behave in a counterfactual world, it is a measurement of response to the self-set target and, in that way, is indicative of behavioral shifts. The Talanoa Conference is only an early measure of behavioral effectiveness, however, and successful shifting behavior will ultimately be measured by outcomes in 2020, 2025, and further into the future.

If parties are not on track to meet their NDCs by the time of the Talanoa Conference, it will be a much clearer indication of a failure of behavioral effectiveness. The NDCs are self-created targets designed by each country to be unambitious enough to be met. If the parties do not change behavior sufficiently in response to the Paris Agreement, even to reach their own

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[278] *China*, CLIMATE ACTION TRACKER, http://climateactiontracker.org/countries/china.html (last visited Dec. 18, 2017) (noting also that this NDC target is far too unambitious to satisfy the broader goal of the Paris Agreement).

[279] Amitabh Sinha, *India on course to achieve its 2030 climate targets: New report*, INDIAN EXPRESS (Nov. 8, 2017), http://indianexpress.com/article/world/india-on-course-to-achieve-its-2030-climate-targets-new-report-4928512/.

[280] Brad Plumer & Nadja Popovich, *Here's How Far the World Is From Meeting Its Climate Goals*, N.Y. TIMES (Nov. 6, 2017), https://www.nytimes.com/interactive/2017/11/06/climate/world-emissions-goals-far-off-course.html (describing different emissions trajectories for several nations).

[281] *U.S.A.*, CLIMATE ACTION TRACKER, http://climateactiontracker.org/countries/usa.html (last visited Dec. 18, 2017) (rating the United States "critically insufficient" for its intent to withdraw from the Agreement).

[282] *See generally* TAKESHI KURAMOCHI ET AL., STATES, CITIES AND BUSINESSES LEADING THE WAY: A FIRST LOOK AT DECENTRALIZED CLIMATE COMMITMENTS IN THE US (2017), https://newclimate.org/2017/09/13/states-cities-and-businesses-leading-the-way-a-first-look-at-decentralized-climate-commitments-in-the-us/.

unambitious targets, the Agreement will not be particularly effective, at least initially (and likely in the long run), at shifting behavior.

Problem-solving effectiveness of the Paris Agreements Articles 4 and 13 can be viewed narrowly or broadly, similar to the analysis of Agenda 21. Narrowly, the Paris Agreement has high problem-solving effectiveness if NDCs are reported, matched with national mitigation programs that allow parties to meet those NDCs, and are ratcheted upward in ambition over time. More broadly, the problem-solving effectiveness of the Paris Agreement will be revealed by whether the action of the parties achieves the substantive aspirations of the Agreement and its parent agreement, the UNFCCC; that is, whether the Agreement brings the world onto a trajectory for which the global mean temperature maximum increase is "well below 2°C" above preindustrial temperatures.[283] Agenda 21 may initially have partially met its narrow goal of garnering participation of a majority of countries. However, it failed on its broader goal of ensuring development was protective of the environment and resulted in the elimination of poverty.

The initial indication of the narrow problem-solving effectiveness of the Paris Agreement overlaps with both the legal and behavioral indicators. The parties submitted NDCs at a high rate. However, while it appears that countries may be on track to meet these NDCs, actual shifts in emission trajectories will not be evident until future stocktakes, although the Talanoa Conference will provide some indication. If parties meet their NDCs and continue to submit NDCs over time of greater ambition, the Paris Agreement will demonstrate effectiveness with respect to its narrow problem-solving goal. A failure to submit NDCs in the future will be a clear indication of a failure of this goal. Failure to meet NDCs and to increase NDC ambition will support a conclusion that the Paris Agreement does not show narrow problem-solving effectiveness.

Whether or not the world is likely to meet the broader goal of the Paris Agreement—to stay under the 2°C ceiling—will be measurable in the near future. There is only a narrow window of time left during which emissions can be reduced sufficiently to keep temperature increases below 2°C. Since greenhouse gases accumulate in the atmosphere, insufficiently reducing emissions or offsetting with carbon sinks will drive the world to a point at which it will be impossible to reduce global mean temperature increase below

[283] Paris Agreement, *supra* note 14, at art. 2(1)(a).

this target. Currently, NDC submissions are of such low ambition that they add up to a projected (and catastrophic) global mean temperature increase of 2.6–3.2°C.[284] These estimated increases overshoot the 1.5°C limit targeted in the Paris Agreement; they breeze past the estimate many scientists identify as a mean maximum increase of 1°C.[285] Unless parties increase the ambition of their NDCs *and* meet this ambition with substantive action soon, the Paris Agreement will fail broadly because the world will be locked into temperature increases of 2°C or higher.

The international community, excluding the Trump delegation, made clear at the Bonn Conference that it is aware the clock is ticking.[286] The Talanoa Facultative Dialogue and its stocktake will provide an important window into the broader goal.[287] If analysis at that point indicates 1.5°C or 2.0°C is possible and even perhaps probable given Party reporting, there is hope that the Agreement will be successful broadly. If the window at that point is considered closed to meet a 2.0°C cap, it will indicate that the Agreement has failed in achieving the broader problem-solving goal of staying under 2.0°C.

B. The Differences Between the Paris Agreement and Agenda 21, and Their Implications

The Paris Agreement differs from Agenda 21 in terms of structure, obligations, and global context. Structurally, its clear targets, ratcheting mechanism for increasing NDC ambition, and binding nature distinguish the Agreement from Agenda 21. In addition, there is a higher sense of urgency with respect to climate change than sustainable development. These differences may provide the additional force needed to drive the parties to act consistently with the larger goals of the Agreement.

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[284] David G. Victor et al., *Prove Paris was more than paper promises*, 548 NATURE 25 (2017), available at https://www.nature.com/news/prove-paris-was-more-than-paper-promises-1.22378 (calling for governments to remedy the current failure under the Paris Agreement's framework to achieve progress necessary to combat climate change); *see also* CLIMATE ACTION TRACKER, *supra* note 39.

[285] Hansen et al, *supra* note 37, at 7, 15 (concluding that a 1°C average maximum increase is the upper limit that will prevent catastrophe and potential positive feedbacks).

[286] EARTHTALK, *Have We Passed the Point of No Return on Climate Change?*, SCI. AM. (Apr. 13, 2015), https://www.scientificamerican.com/article/have-we-passed-the-point-of-no-return-on-climate-change/ (presenting concerns regarding how close the world's governments are to the point of being unable to prevent the worst of climate change).

[287] *2018 Talanoa Dialogue*, *supra* note 268.

The Paris Agreement has a much clearer target than Agenda 21 to reduce emissions, increase sequestration, and cap the global mean temperature increase. Thus, the legal requirements of the parties in the Paris Agreement, to identify actions that will reduce emissions and report on potential NDCs, are far clearer than Agenda 21's fairly fuzzy goal of integrating environmental and economic concerns into decision-making. Furthermore, Agenda 21 did not incorporate a mechanism to increase consideration of sustainability over time. The Paris Agreement's NDC ambition ratcheting mechanisms allows for parties to move towards the final goal over time. Finally, unlike Agenda 21, where engagement appears to have gone down over time, the reporting requirement of the Paris Agreement is obligatory.

Additionally, while sustainable development is a compelling idea, it is more of an existential imperative rather than a current emergency. The effects of climate change, on the other hand, while hard to perceive, are getting easier to identify, as rates of extreme weather events are increasing, icebergs are melting, and forest fires are growing in frequency and intensity. Thus, there is perhaps a greater sense of direct threat from climate change than from a failure to sustainably develop. Furthermore, the push for sustainable development was an attempt to marry what very well may not be marriageable ideas: development and environmental protection. The Paris Agreement is primarily focused on one specific problem: climate change. It includes no balancing or directly opposing goals of the type Agenda 21 included. This unitary goal may provide the clarity of action sufficient to support achieving its goal.

That said, addressing climate change ultimately requires parties to make unpalatable decisions. While bottom-up agreements are more likely to pull parties in, they sacrifice ambition in doing so. Ultimately, whether or not the Paris Agreement succeeds will be a measure of whether the sacrifice of ambition to facilitate increased participation at the outset leads to the legal, behavioral, and problem-solving effectiveness necessary for the Agreement to successfully address climate change. Compliance with NDC reporting mechanisms and its impact on the behavior of the parties is the heart of the Agreement's design. Parties are currently engaged with this process. Whether they continue, and sufficiently shift their behavior and NDC ambitions, remains to be seen.

Ultimately, however, even if the Paris Agreement fails in its broader goal of limiting temperature increases to 1.5°C, fails to prevent catastrophic

temperature increases, it may still curb climate change. A 2.1°C temperature increase is very different than a 2.5°C, a 3.0°C, or the 3.7–4.0°C path the world is currently on based on aggregate emission data.[288] For example, a world with a 3°C increase over pre-industrial times will see Osaka, Japan, Miami, USA, and Shanghai, China under water.[289] In pulling the world together, year after year, to review progress on mitigating climate change, the Paris Agreement brings it into the public sphere again and again. Beyond mitigation, the Paris Agreement also makes room for adaptation and for addressing the loss and damage faced by many nations such as Kirabati, which is losing territory as a result of rising seas. As such, it provides a sphere of collaboration that, as the storms and droughts and forest fires increase in frequency and severity, recognizes the need to act together to face the current reality that is climate change.

[288] CLIMATE ACTION TRACKER, *supra* note 39.

[289] *The three-degree world: the cities that will be drowned by global warming*, GUARDIAN (Nov. 3, 2017), https://www.theguardian.com/cities/ng-interactive/2017/nov/03/three-degree-world-cities-drowned-global-warming (providing description and mapping of the impact of sea level rise at a 3°C mean temperature increase by the end of the century).