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New Realities Require New Priorities: Rethinking Sustainable Development Goals in the Anthropocene

Robin Kundis Craig

S.J. Quinney College of Law, University of Utah, robin.craig@law.utah.edu

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NEW REALITIES REQUIRE NEW PRIORITIES: RETHINKING SUSTAINABLE DEVELOPMENT GOALS IN THE ANTHROPOCENE

by Robin Kundis Craig & J.B. Ruhl

ABSTRACT

The United Nations 17 sustainable development goals are nominally unprioritized. However, numerically and rhetorically, the list effectively makes development goals more important than the environmental goals. This de facto prioritization, however, is deeply flawed in two respects. First, as early sustainable development theorists acknowledged, the environment is the boundary of, not co-equal to, development, constraining potential progress both economically and socially. The Anthropocene's rapidly accelerating deterioration of the global ecological and physical processes that make human development possible will ultimately constrain development options and potential. Second, human priorities will also change dramatically as adaptation to climate change—the most visible impact of the Anthropocene—becomes a pressing and unavoidable necessity. Development will become secondary to survival for vast expanses of the human global population, who will demote environmental goals where health and security are at stake. Investing in the long-term resilience of our changing environment, in the resilience of humanity's response to that changing environment, and in the harmonization of these two new sets of goals, therefore, are the necessary first steps to ensuring that the other sustainable development goals have any prayer of becoming achievable. The Anthropocene calls the entire sustainable development project into existential doubt—or at least puts it into hibernation until these new higher priorities are satisfied—a fact that the purveyors of sustainable development goals would do well to acknowledge.

INTRODUCTION

In 2015, the United Nations member countries adopted the 2030 Agenda for Sustainable Development, *Transforming Our World*,¹ at the heart of which were 17 Sustainable Development Goals, or SDGs.² In order of the United Nations' numbering (see Figure 1), these 17 goals are: (1) no poverty; (2) zero hunger; (3) good health and well-being; (4) quality education; (5) gender equality; (6) clean water and sanitation; (7) affordable and clean energy; (8) decent work and economic growth; (9) industry, innovation, and infrastructure; (10) reduced inequality; (11) sustainable cities and communities; (12) responsible consumption and production; (13) climate

¹ United Nations General Assembly, *Transforming Our World: The 2030 Agenda for Sustainable Development* (A/Res/70/1) (25 Sept. 2015), available at <https://sustainabledevelopment.un.org/post2015/transformingourworld>.

² United Nations, *Sustainable Development Goals*, <https://sustainabledevelopment.un.org/?menu=1300> (as viewed May 1, 2019). For a broader discussion of the SDGs as a governance mechanism, see Frank Biermann, Norichika Kanne, & Rakhyun E. Kim, *Global governance by goal-setting: the novel approach of the UN Sustainable Development Goals*, 26-27 CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY 26, 26-31 (2017).

action; (14) life below water; (15) life on land; (16) peace, justice and strong institutions; and (17) partnerships to meet the goals.³



Figure 1: United Nations Sustainable Development Goals

SOURCE: un.org

Officially, these 17 goals are unprioritized co-equal aims. For example, *Transforming Our World* noted that the 17 goals “are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental.”⁴ It categorized them into five interlocking areas of critical importance: People, Planet, Prosperity, Peace, and Partnership.⁵ As one commentator has emphasized, “in UN rhetoric, the agenda is ‘indivisible’ and countries should implement the agenda as a whole.”⁶

In fact, however, the United Nations and member nations actively prioritize the social and economic goals over the environmental—in numbering, in rhetoric, and in practice. For example, it is no accident that eradicating poverty is the first goal, because the *Transforming Our World* resolution “recognize[d] that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable

³ *Id.*

⁴ *Transforming Our World*, *supra* note 1, at 1. *See also id.* at 2 (“The interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realized.”); Biermann, Kanne, & Kim, *supra* note 2, at 28-29 (emphasizing that all of the goals need to be met and that trade-offs among them should be avoided); Måns Nilsson, Dave Griggs, & Martin Visbeck, *Map the interactions between Sustainable Development Goals*, 534 *NATURE* 320, 320 (June 16, 2016) (emphasizing that *Transforming Our World* “entwines economic, social and environmental targets in 17 Sustainable Development Goals (SDGs) as an ‘indivisible whole’.”).

⁵ *Transforming Our World*, *supra* note 1, at 2.

⁶ Nina Weitz, Henrik Carlsen, Måns Nilsson, & Kristian Skånberg, *Towards systemic and contextual priority setting for implementing the 2030 Agenda*, 13 *SUSTAINABILITY SCIENCE* 531, 531 (2018).

development.”⁷ It emphasized that “[w]e are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet” and that the goals “seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls.”⁸

The planet, in contrast, is rhetorically the *last* focus of the United Nations’ efforts. Not accidentally, environmental goals come toward the very end of the SDGs, as #13, #14, and #15. Similarly, in *Transforming Our World*, “our world” comes last:

resolve, between now and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; *and to ensure the lasting protection of the planet and its natural resources.* . . .

As we embark on this great collective journey, we pledge that no one will be left behind. Recognizing that the dignity of the human person is fundamental, we wish to see the Goals and targets met for all nations and peoples and for all segments of society. And we will endeavour to reach the furthest behind first.⁹

Experts agree. In the “SDGs in Order” project, for example, a team of researchers from the OECD, Bretton Woods II, and GreenHouse took an economic funding approach to prioritizing the SDGs, noting that:

It has been estimated it will cost upwards of US \$45 trillion over 15 years to fulfill the SDGs and meet their many targets. But funding currently flows unevenly and in directions determined almost exclusively by personal or organizational interests. We contend that funding - and the efforts it enables - will be much more effective if directed in a more logical sequence: Step 1 facilitates Step 2; Step 2 facilitates Step 3; etc.¹⁰

When the team asked 85 expert economists, social scientists, and political scientists¹¹ to rank the SDGs in order of how they should be pursued, Life Below Water (SDG 14) came in 17th, Life on Land (SDG 15) came in 15th, and Climate Action (SDG 13) came in 11th, with Responsible Consumption and Production (SDG 12) finishing at 13th.¹² Funders, similarly, target health and education, not the environmental SDGs.¹³

⁷ *Transforming Our World*, *supra* note 1, at 1. See also *id.* at 3 ¶ 2 (“We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development.”).

⁸ *Id.*

⁹ *Id.* at 3 ¶¶ 3, 4 (emphasis added).

¹⁰ Jeff Leitner, *SDGs in Order: The first ever sequence for tackling the most important problems in the world: FAQ*, <https://www.sdgsinorder.org/faq> (New America & OECD 2017, as viewed June 7, 2019).

¹¹ *Id.*

¹² Jeff Leitner, *SDGs in Order: The first ever sequence for tackling the most important problems in the world: Goals in Order*, <https://www.sdgsinorder.org/goals> (New America & OECD 2017, as viewed June 7, 2019).

¹³ SDG Funders, *Sustainable Development Goals*, <https://sdgfunders.org/sdgs/> (as viewed June 7, 2019).

In practice, moreover, nations are effectively following the experts’ advice and de-prioritized the environmental SDGs. The SDGs are not legally binding, and “governments retain maximum freedom in interpreting and implementing the goals if they so choose.”¹⁴ And they do so choose. In a survey report published in 2018, SDG 14—Life Below Water, or the ocean—came in dead last of the SDGs in perceived importance among governments.¹⁵ “Only 5.4 percent of the respondents included it in their top six priorities, compared to 65.2 percent for quality education or 60 percent for decent work and economic growth.”¹⁶ As Figure 2 indicates, SDG 13 (Climate Action) and SDG 15 (Life on Land) fared only slightly better, and the report’s first finding was that “[l]eaders emphasize education, jobs, and strong institutions, but turn a deaf ear to climate change and other environmental goals.”¹⁷ The report further notes that “[d]espite considerable international attention in recent years, individual environmental issues related to climate action, life on land, life below water, and responsible consumption and production fall to the bottom of most leaders’ development priorities.”¹⁸ While a nation’s wealth does matter to some priorities—“Leaders in low-income countries emphasize issues related to the most basic needs of their population—health, food, water, and energy. Comparatively, their wealthier peers pay attention to higher order issues of inequality and sustainable cities”¹⁹—it makes little difference regarding where the environmental SDGs fall.

How frequently does a global goal appear in leaders’ top priorities?

Percentage of respondents who identified a goal as one of their top six priorities.

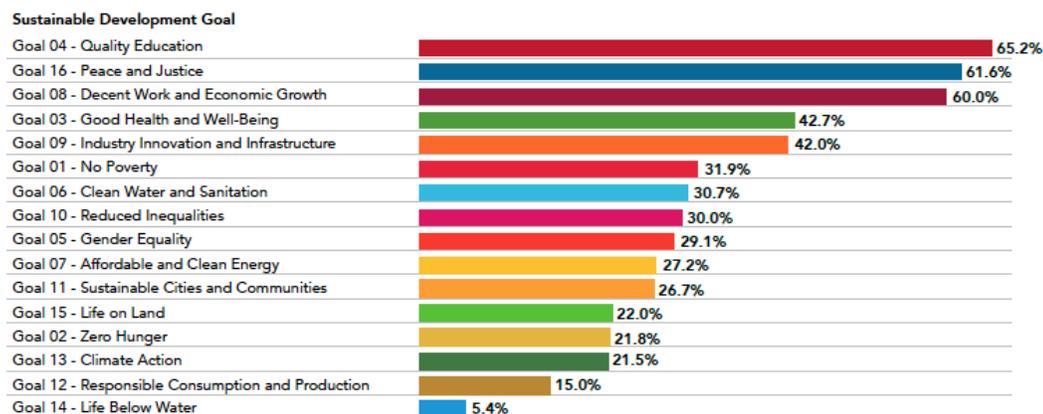


Figure 2: The Real Prioritization of the SDGs

SOURCE: Custer et al. 2018²⁰

¹⁴ Beirmann, Kanne, & Kim, *supra* note 2, at 27.

¹⁵ Tim McDonnell, “The U.N. Goal that Doesn’t Get a Lot of Respect,” *NPR Goats and Soda: Stories of Life in a Changing World*, May 31, 2018, <https://www.npr.org/sections/goatsandsoda/2018/05/31/614493772/the-u-n-goal-that-doesnt-get-a-lot-of-respect>.

¹⁶ *Id.*

¹⁷ Samantha Custer, Matthew DiLorenzo, Takaaki Masaki, Tanya Sethi, & Ani Harutyunyan, AIDDATA, “Executive Summary,” *Listening to Leaders 2018: Is development cooperation tuned-in or tone deaf?* 2 (2018), available at http://docs.aiddata.org/ad4/pdfs/Listening_To_Leaders_2018_Executive_Summary.pdf.

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.* at 6.

Clearly, therefore, nations are in fact prioritizing the SDGs—but they are getting it wrong, privileging short-term development improvements over ensuring long-term survival. Importantly, their de-prioritization of the environment does not go uncontested. For example, while businesses agree with governments that SDG 14, Life Below Water, is the least important goal, they also rank Climate Action (SDG 13) as the *most* important.²¹ Scientists, in contrast, would elevate SDG 14 in priority, “highlight[ing] the importance of the ocean for achieving the Sustainable Development Goals, and suggest[ing] that achieving Oceans targets has important co-benefits through supporting diverse aspects of sustainable development and rarely presents negative trade-offs.”²² Nevertheless, because governments direct the priority of national investment in the SDGs, their sense of SDG prioritization is the most critical for environmental law and policy.

The political and social prioritization of short-term benefits is obviously not unique to the SDGs; indeed, psychologists and neurologists indicate that humans may be hard-wired to ignore amorphous long-term threats like climate change.²³ Nevertheless, it is perverse. Nations are turning a blind eye as well as a deaf ear to the fragility of the social and economic SDGs in the face of the Anthropocene. This perversity pervades *Transforming Our World*, which simultaneously recognizes climate change as an existential threat but still figures it as [just] one force operating to exacerbate humanity’s *real* challenges:

We are meeting at a time of immense challenges to sustainable development. Billions of our citizens continue to live in poverty and are denied a life of dignity. There are rising inequalities within and among countries. There are enormous disparities of opportunity, wealth and power. Gender inequality remains a key challenge. Unemployment, particularly youth unemployment, is a major concern. Global health threats, more frequent and intense natural disasters, spiralling conflict, violent extremism, terrorism and related humanitarian crises and forced displacement of people threaten to reverse much of the development progress made in recent decades. *Natural resource depletion and adverse impacts of environmental degradation, including desertification, drought, land degradation, freshwater scarcity and loss of biodiversity, add to and exacerbate the list of challenges which humanity faces.* Climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development. Increases in global temperature, sea level rise, ocean acidification and other climate change impacts are seriously affecting coastal areas and low-lying coastal countries, including many least developed countries and small island developing States. The survival of many societies, and of the biological support systems of the planet, is at risk.²⁴

²¹ World Business Council for Sustainable Development, *Latest trends and challenges regarding business integration of the Sustainable Development Goals*, <https://www.wbcsd.org/Programs/People/Sustainable-Development-Goals/News/Latest-trends-and-challenges-regarding-business-integration-of-the-SDGs> (as viewed June 7, 2019).

²² Gerald G. Singh et al., *A rapid assessment of co-benefits and trade-offs among Sustainable Development Goals*, 93 *Marine Policy* 223, 228 (2018); Mara Ntona & Elisa Morgera, *Connecting SDG 14 with the other Sustainable Development Goals through marine spatial planning*, 93 *Marine Policy* 214, 215, 220 (2018).

²³ GEORGE MARSHALL, DON’T EVEN THINK ABOUT IT: WHY OUR BRAINS ARE WIRED TO IGNORE CLIMATE CHANGE 46-51 (2014).

²⁴ *Transforming Our World*, *supra* note 1, at 5 ¶ 14.

In this chapter, we argue that the existential threat of climate change (and its associated phenomena like ocean acidification) demands reprioritization of political and economic capital toward the environmental goals. To put it bluntly, environmental deterioration is not *a* challenge, as the U.N. would have it, but *the* challenge of our time. As scholars have noted, “All the success in poverty eradication under the previous development programmes could be negated if the ambitious goals under the climate convention and its Paris Agreement are not met.”²⁵

Our logic is simple: Existential threats from the environmental realm can render incremental social and economic betterment—i.e., progress toward the rest of the SDGs—irrelevant, and for two reasons. First, as early sustainable development theorists acknowledged, the environment is the boundary of, not co-equal to, development. As such, it constrains potential progress both economically and socially. The Anthropocene’s rapidly accelerating deterioration of the global ecological and physical processes that make human development possible will ultimately constrain development options and potential. Second, human priorities will also change dramatically as adaptation to climate change—the most visible impact of the Anthropocene—becomes a pressing and unavoidable necessity. Development will become secondary to survival for vast expanses of the human global population who currently do not routinely face survival threats, as in the United States. Understandably, these populations will demote environmental goals when health and security are at stake. Investing in the long-term resilience of our changing environment, in the resilience of humanity’s response to that changing environment, and in the harmonization of these two new sets of goals, therefore, are the necessary first steps to ensuring that the other sustainable development goals have any prayer of becoming achievable—and that environmental law survives as a discipline.

PRIORITIZING THE SDGs: ACKNOWLEDGING THE TRADE-OFFS

As noted, despite the U.N.’s insistence that nations should be pursuing all 17 SDGs simultaneously, governments are in fact privileging some over others. Prioritization of the SDGs is probably inevitable. “Prioritizing is the process of determining what is most important.”²⁶ Prioritization is an inherently rational activity in a world of bounded resources, whether those resources be hours in a day, money to invest, or natural resources to exploit. There have been very few moments in history when particular individuals or societies could “have it all,” simultaneously fulfilling *all* their needs and desires. Much more normally, resource constraints force individuals, societies, nations, and now, arguably, the entire global population to pick and choose among these needs and desires—to prioritize. Thus, nations have prioritized among the SDGs and subsidiary targets because they cannot economically or in terms of social capacity simultaneously achieve all 17 at once.²⁷

²⁵ Biermann, Kanne & Kim, *supra* note 2, at 28.

²⁶ Plan Plus Online, <https://www.planpluseonline.com/importance-prioritizing/> (as viewed June 4, 2019).

²⁷ Weitz et al., *supra* note 6, at 531-32 (noting that “when it comes to action, governments and other actors have both competing priorities and limited budgets. Interests might clash and goals be seen to counteract each other,” and different kinds of needed knowledge are often missing).

The question is how to think about that prioritization, and what criteria should be used to establish priorities. Although context and point of view clearly matter in terms of prioritizing among the SDGs—the proposed priorities for *scientists* helping to implement the SDGs²⁸ look nothing like the political-economic choices that *nations* have made among the SDGs, and nations themselves vary depending on their individual situations²⁹—we here focus on the nearly universal decision to de-prioritize the environmental SDGs and the role of trade-offs in the prioritization impulse.

Many of the SDGs do involve trade-offs, meaning that pursuit of one goal can undermine achievement of another.³⁰ Indeed, much of the literature regarding prioritization of the SDGs focuses on how the goals—or, more appropriately, the 169 specific targets that better define the SDGs—interact, identifying where one target is a necessary first step to another, where there can be synergies among targets, and where there are generally trade-offs between targets.³¹

Balancing trade-offs among the three aspects of sustainable development—environment, society, and economy—has long been an integral part of sustainable development *theory*, if not always sustainable development *practice*. As sustainable development scholar Jennifer Elliott explains, “achieving sustainable development in practice regularly involves trade-offs across the different spheres” and “difficult choices have to be made at particular points in time and at particular scales as to what is being pursued and how”³²

Nevertheless, while trade-offs among sustainable development spheres are thus inevitable, the “balancing” of those trade-offs has traditionally and repeatedly cut against the environmental sphere in favor of the social and economic. The perverse result is that “environmental degradation continues to threaten human well-being, social cohesion and development opportunities worldwide”³³

Such perversity demands explanation—and there is one. As government officials appear to recognize intuitively, there is another trade-off inherent in the SDGs: the trade-off between local and short-term social and economic benefits and global and long-term environmental improvement. To date, nations effectively have been using what might be considered default criteria to prioritize among the SDGs—politically cognizable and certain benefits get higher priority than murky and uncertain benefits. The environmental SDGs lose on both counts. Immediate social and economic improvements like nearby supplies of clean water, a functional health care system, and increased employment are far more cognizable, socially and politically, than incremental and often unmeasurable contributions to the planet’s long term health and functionality. In addition, what a nation gets for investing in environmental protection is often far more uncertain than what it gets for investing in social and economic improvement. As the 2018 survey report noted, “[o]ne possible explanation” for the de-prioritization of the environmental

²⁸ Yonglong Lu et al., *Five priorities for the UN Sustainable Development Goals*, 520 NATURE 432, 432-33 (April 23, 2015).

²⁹ Custer et al., *supra* note 17, at 2-8.

³⁰ *Id.* at 532.

³¹ *E.g.*, Weitz et al., *supra* note 6, at 533-38; Singh et al., *supra* note 22, at 223-27.

³² JENNIFER A. ELLIOTT, AN INTRODUCTION TO SUSTAINABLE DEVELOPMENT 21 (4th ed. 2013).

³³ *Id.* at 116.

SDGs is that “leaders are loath to tackle issues that require large upfront costs in exchange for uncertain future benefits.”³⁴

This more oblique SDG trade-off is not new. In business and economic settings, the trade-offs between short-term profits and long-term contributions to sustainability are so well-recognized that they have been translated into game theory lessons for college students.³⁵ Natural resource managers, similarly, routinely wrestle with how to balance short-term social and economic benefits against long-term sustainability of the resource, including the long-term social and economic benefits of being able to rely on the resource indefinitely, if at lesser rates of exploitation.³⁶

The problem with current government evaluations of the trade-off is two-fold. First, the environment is not, and has never been, the co-equal pillar of sustainable development that the U.N. likes to assume. Instead, the environment is the boundary of social and economic development. When things are going well, it is the defining source of ecosystem goods and services that allow human societies to exist, and in this sense all human societies are always social-ecological systems. In terms of prioritization, therefore, inattention to the environment for short-term social and economic gain gets the true priorities for sustainability exactly backward.

Second, things *aren't* going well. On the environmental side of the sustainable development triangle, the short-term and the long-term are no longer fungible. Indeed, at the extreme, the trade-off for incrementally improving the well-being of people alive today could be the collapse of Planet Earth and all of the human societies it supports at some not-extremely-distant point in the future. Specifically, the probability of holding the climb in atmospheric temperature to 2°C above pre-industrial levels—the central goal of the Paris Agreement³⁷—is rapidly approaching zero.³⁸ Barring a global political miracle, technological breakthrough, or economic collapse, we will surpass 2°C and enter an era of climate dystopia.³⁹ How long that lasts before, if ever, we turn the corner is anyone's guess. But particularly in wealthy nations like the United States where day-to-day survival is no longer a *pervasive* concern (although we acknowledge that for far too many people in the U.S., it is an *individual* concern), the environmental SDGs need to become national priorities if environmental law itself is to survive.

³⁴ Custer et al, *supra* note 17, at 2.

³⁵ Hilde Patron & William J. Smith, *The Short-Term and Long-Term Trade-Offs of Sustainable Entrepreneurship*, 16:1 J. ECONOMIC EDUCATORS 36, 36-48 (2016), available at <http://capone.mtsu.edu/jee/2016/pp36-48ms215.pdf>.

³⁶ E.g., Simon Mardle & Sean Pascoe, *Modelling the effects of trade-offs between long and short-term objectives in fisheries management*, 65:1 J. ENVTL. MANAGEMENT 49, 49-62 (May 2002), <https://doi.org/10.1006/jema.2001.0518>.

³⁷ See Yun Gao et al., *The 2 °C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change—From the United Nations Framework Convention on Climate Change to the Paris Agreement*, 3 ENGINEERING 272 (2017), available at <https://www.sciencedirect.com/science/article/pii/S2095809917303077>.

³⁸ Brad Plummer and Nadja Popovich, *Here's How Far the World Is from Meeting Its Climate Goals*, NEW YORK TIMES, Nov. 6, 2017, available at <https://www.nytimes.com/interactive/2017/11/06/climate/world-emissions-goals-far-off-course.html>.

³⁹ See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5 °C (Oct. 6, 2018), available at <http://www.ipcc.ch/report/sr15/> [hereinafter IPCC, GLOBAL WARMING OF 1.5 °C]. The IPCC report compares conditions between a 1.5 °C rise and a 2.0°C rise, describing the latter as disproportionately worse after the marginal 0.5°C rise. The IPCC has not endeavored to project what conditions may look like beyond a 2.0°C rise. For a credible and horrifying projection, see DAVID WALLACE-WELLS, *THE UNINHABITABLE EARTH: LIFE AFTER WARMING* (2019). For a fictional account of such a world, see KIM STANLEY ROBINSON, *NEW YORK 2140* (2018).

THE ENVIRONMENTAL SDGs ARE THE TRUE PRIORITIES

The United Nations tends to adhere to the three pillars or interlocking circles models of sustainability,⁴⁰ under which the three aspects of sustainable development—environment, economy, and society—are co-equal ambitions, the so-called “triple bottom line,” as the concept gets translated into business.⁴¹ A better model, however, is the “nested spheres” model (Figure 3). This model “portrays an understanding of environmental limits setting the boundaries within which a sustainable society and economy must be sought,” “presents a better illustration of how all human activities depend fundamentally on nature,” and “portrays more clearly how activities that damage the functioning of natural systems ultimately weaken the basis of human existence itself.”⁴²

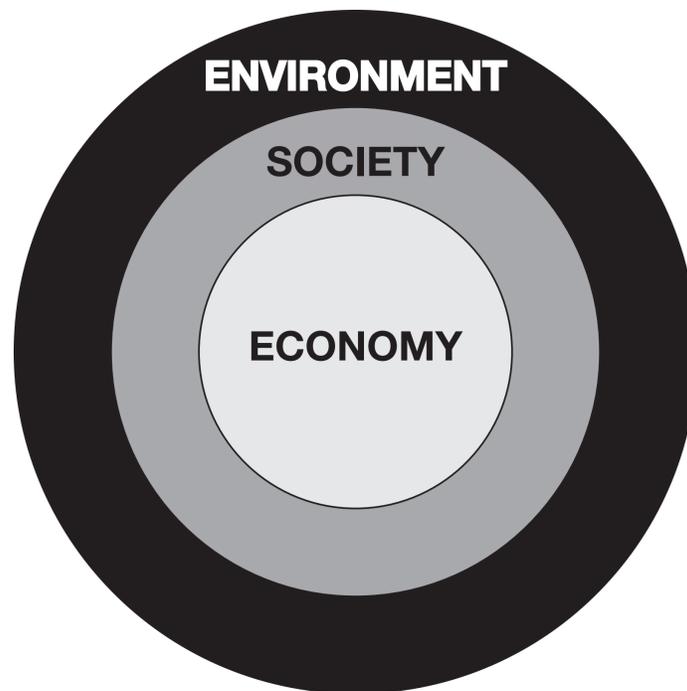


Figure 3: The Nested Spheres Model of Sustainable Development

There are many ways to illustrate the dependence of human societies and economies on the environmental realm, but perhaps one of the best is ecosystem services. “Ecosystem goods (such as food) and services (such as waste assimilation) represent the benefits human populations derive,

⁴⁰ ELLIOTT, *supra* note 34, at 20 fig. 1.6, 21.

⁴¹ University of Wisconsin, *The Triple Bottom Line*, <https://sustain.wisconsin.edu/sustainability/triple-bottom-line/> (as viewed June 5, 2019).

⁴² ELLIOTT, *supra* note 34, at 21.

directly or indirectly, from ecosystem functions.”⁴³ In 1997, Robert Costanza and a small army of colleagues “estimated that at the current margin, ecosystems provide at least US\$33 trillion dollars worth of services annually,” with a possible range of \$16 trillion to \$54 trillion per year.⁴⁴ (In comparison, global GDP at the end of 1997 was US\$31.44 trillion.⁴⁵) A few years later, the Millennium Ecosystem Assessment project adopted an ecosystem services approach to describing global environmental degradation and its impacts on human society.⁴⁶ It concluded that:

Everyone in the world depends completely on Earth’s ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment. Over the past 50 years, humans have changed these ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This transformation of the planet has contributed to substantial net gains in human well-being and economic development. But not all regions and groups of people have benefited from this process—in fact, many have been harmed. Moreover, the full costs associated with these gains are only now becoming apparent.⁴⁷

Specifically, “approximately 60% (15 out of 24) of the ecosystem services examined during the Millennium Ecosystem Assessment are being degraded or used unsustainably, including fresh water, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards, and pests.”⁴⁸ Moreover, “changes being made in ecosystems are increasing the likelihood of nonlinear changes in ecosystems (including accelerating, abrupt, and potentially irreversible changes),” portending a riskier future for human society.⁴⁹

Importantly for this chapter, the Millennium Ecosystem Assessment recognized that contemporary environmental degradation is the manifestation of a short-term/long-term trade-off—that is, that exploitation of the environment to supply immediate needs, such as food, often “defer[s] costs to future generations.”⁵⁰ Thus, “[i]n the aggregate, and for most countries, changes made to the world’s ecosystems in recent decades have provided substantial benefits for human well-being and national development.”⁵¹ Nevertheless, the Assessment emphasized, these short-term benefits were obtained at the cost of substantial future risks to human well-being: “These gains have been achieved . . . at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes in ecosystems, the exacerbation of poverty for some people, and growing inequities and disparities across groups of people.”⁵² The Assessment thus

⁴³ Robert Costanza et al., *The value of the world’s ecosystem services and natural capital*, 387 NATURE 253, 253 (May 15, 1997).

⁴⁴ *Id.* at 259.

⁴⁵ *World GDP by Year*, <https://www.multpl.com/world-gdp/table/by-year> (as viewed June 5, 2019).

⁴⁶ MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS vi fig. A (2005), available at <http://www.millenniumassessment.org/documents/document.356.aspx.pdf>.

⁴⁷ *Id.* at 1.

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.* at 5.

⁵² *Id.* at 6.

confirmed what paleoenvironmental historian Tim Flannery had argued in late 1993: humans are future-eaters.⁵³

Even in 2005, degradation of the environment was already considered a risk to global development goals,⁵⁴ and the Millennium Ecosystem Assessment expected the problem only to increase over the next half-century:

The consumption of ecosystem services, which is unsustainable in many cases, will continue to grow as a consequence of a likely three- to sixfold increase in global GDP by 2050 even while global population growth is expected to slow and level off in mid-century. Most of the important direct drivers of ecosystem change are unlikely to diminish in the first half of the century and two drivers—climate change and excessive nutrient loading—will become more severe.⁵⁵

The realization that environmental degradation may make sustainable development unachievable has only become more acute in the context of climate change.⁵⁶ In 2006, the International Union for the Conservation of Nature (IUCN) noted that “the evidence is that the global human enterprise is rapidly becoming less sustainable and not more.”⁵⁷ In 2014, the Intergovernmental Panel on Climate Change (IPCC) acknowledged that climate change posed a threat to sustainable development.⁵⁸ The outer sphere of the nested spheres is starting to contract, strongly suggesting that nations should be prioritizing the environmental SDGs.

Instead, in de-prioritizing the environmental SDGs, governments around the world have essentially inverted the nested spheres understanding of sustainable development, declining to invest in the sphere that could ultimately expand both social and economic prosperity. While these decisions are understandable, particularly in nations where day-to-day survival for large swaths of the population remains precarious, they nevertheless privilege the incremental improvement of present-day populations over the development options of future generations—even leaving climate change and the rest of the Anthropocene to the side for the moment. At bottom, these prioritizations ignore the bedrock fact that all societies and economies are “embedded parts of the biosphere.”⁵⁹

In contrast, Stockholm Resilience Centre director Johan Rockström and colleague Pavav Sukhdev have re-envisioned the SDGs to reflect the nested spheres reality of sustainable development (Figure 4). They argue that “[t]his model changes our paradigm for development, moving away from the current sectorial approach where social, economic, and ecological

⁵³ TIM FLANNERY, *THE FUTURE EATERS: ECOLOGICAL HISTORY OF THE AUSTRALASIAN LANDS AND PEOPLE* (Reed hc 1993).

⁵⁴ MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 48, at 2.

⁵⁵ *Id.*

⁵⁶ MELINDA HARM BENSON & ROBIN KUNDIS CRAIG, *THE END OF SUSTAINABILITY: RESILIENCE AND THE FUTURE OF ENVIRONMENTAL GOVERNANCE IN THE ANTHROPOCENE* 40-41 (2017).

⁵⁷ W.M. ADAMS, IUCN, *THE FUTURE OF SUSTAINABILITY: RE-THINKING ENVIRONMENT AND DEVELOPMENT IN THE TWENTY-FIRST CENTURY* 3 (2006).

⁵⁸ IPCC, *CLIMATE CHANGE 2014: ADAPTATION AND VULNERABILITY* 1104 (2014).

⁵⁹ Stockholm Resilience Centre, *How food connects all the SDGs*, <https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html> (as viewed June 5, 2019).

development are seen as separate parts. Now, we must transition toward a world logic where the economy serves society so that it evolves within the safe operating space of the planet.”⁶⁰

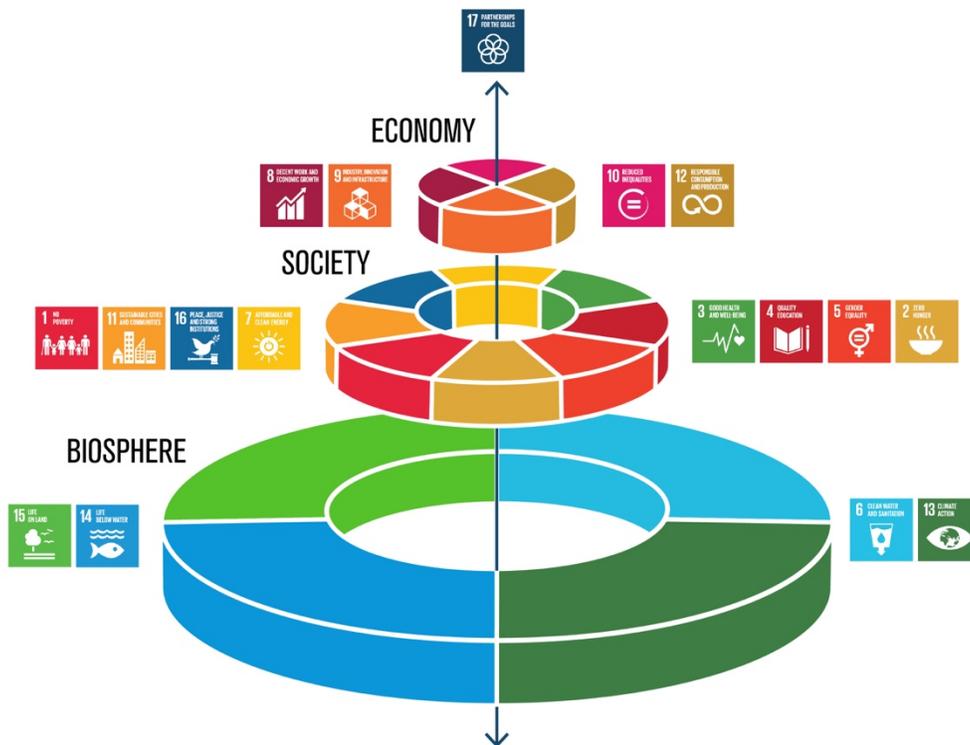


Figure 4: Re-Envisioning the SDGs

CREDIT: Azote Images for Stockholm Resilience Centre, Stockholm University⁶¹

Rockström knows a lot about the “safe operating space” for humanity and how that space might be changing because he is also a lead author in the Planetary Boundaries Project. In *Big World, Small Planet: Abundance Within Planetary Boundaries*, he and Mattias Klum describe the Project,⁶² through which a team of scientists are identifying key planetary boundaries—parameters that, if exceeded, risk transforming the entire Earth and its ecosystems.⁶³ The team has identified nine such planetary boundaries.⁶⁴ Three of these reflect “processes with sharply defined global thresholds” that are “hard-wired into the Earth system and cannot be shifted by human actions,” processes that “are capable of sharp shifts from one state to another, with direct implications for the entire planet.”⁶⁵ These “Big Three” planetary boundaries are climate change, stratospheric ozone depletion, and ocean acidification.⁶⁶ The other six planetary boundaries are biochemical

⁶⁰ *Id.*

⁶¹ This image is available at: <https://www.stockholmresilience.org/images/18.36c25848153d54bd54ba33ec9b/1465905797608/sdgs-food-azote.jpg>.

⁶² JOHAN ROCKSTRÖM & MATTIAS KLUM, *BIG WORLD, SMALL PLANET: ABUNDANCE WITHIN PLANETARY BOUNDARIES* 64-77 (Yale University Press 2015).

⁶³ *Id.* at 64.

⁶⁴ *Id.* at 65 fig. 2.1.

⁶⁵ *Id.* at 69.

⁶⁶ *Id.*

flows (nutrient cycles), atmospheric aerosol loading, novel entities (toxics), biodiversity, freshwater consumption, and land use change.⁶⁷ Notably, as of 2014 biodiversity loss and nutrient flows presented the biggest risks to planetary integrity, with climate change and land-system change posing comparable secondary risks.⁶⁸ Climate change and ocean acidification, however, will become increasingly bigger risks to human civilization in the near future, particularly if the world's nations continue to drag their collective feet in implementing effective climate change mitigation strategies.

The larger point, again, is that humanity has purchased our current social and economic status by drawing down the planet's natural capital to the point of threatening our own future well-being. That fact alone should warrant giving high priority to the environmental SDGs. However, as climate change and ocean acidification pose increasing risks to planetary stability, re-prioritization may become critical to both the future of environmental law and human survival.

THE NEED TO PRIORITIZE SUSTAINABLE DEVELOPMENT GOALS IN FAVOR OF CLIMATE CHANGE ADAPTATION IN THE ANTHROPOCENE

The second in the pair of forces undermining current prioritization of the SDGs is the imminent need to engage in adaptation to climate change on massive scales. If the drive to adapt becomes extreme, as is increasingly likely, among the many casualties will be the sustainable development agenda in general, and environmental law as we know it more specifically.

This acknowledgement paints a bleak picture, but it is one that our and all nations' institutions of environmental law must face. Vast expanses of human populations will demand that their well-being be protected from storms, droughts, pests, diseases, and other intense harms extreme climate change will bring their way. The built environment will be reinforced or moved. Agricultural lands will be retooled or relocated. Halting the spread of crop pests will be a priority. Malaria, dengue fever, and other diseases will be controlled at all costs. Water will be moved to where it is desperately needed. People living where relief is simply unattainable will be relocated or leave on their own accord. Equitable distribution of these and other protective measures will be demanded. These forces of adaptive responses to climate change are not consistent with either the "sustainable" or the "development" principles of sustainable development goals. And if environmental programs such as the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Section 404 of the Clean Water Act (CWA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and their many kin stand in the way of these adaptive responses, they will be mowed down. To be blunt about it: sustainable development policy, and environmental law as a driver of its implementation, must prepare for the climate dystopia or be pushed aside.

Two relatively recent, if smaller scale, examples prove the point. In the wake of the *Deepwater Horizon* oil spill in the Gulf of Mexico in 2010, the federal response team waived the applicability of environmental laws, particularly NEPA, with near abandon, and residents are still living with the resulting decision to use toxic oil dispersants. Similarly, in the California drought

⁶⁷ *Id.*

⁶⁸ *Id.*

of 2012-2016, state officials routinely ignored environmental laws, managing water to keep people alive at the expense of riverine ecosystems and the sometimes endangered species, like salmon, that they support.

The prospect of a climate dystopia means that the agenda for swift and robust controls on greenhouse gas emissions must put its money where its mouth is. For over a decade, mitigation advocates have argued—rightly so—that failure to implement such controls would lead to a drastic global scenario of massive disruption to social-ecological systems. With failure increasingly likely, it would be untenable to suggest that the scenario is less dire than claimed or that adaptation measures of unprecedented scale and magnitude will not be necessary. Rather, climate change “mitigationists” must now work alongside “adaptationists,” and the sustainable development and environmental law agendas will need to conform to the new reality.

To be clear, we are not for a moment suggesting that society back off efforts to control greenhouse gas emissions—even as we pass 2°C, we must continue work to turn global warming around. Rather, it is climate change adaptation, not mitigation, that will push back on sustainable development policy and environmental law as they are currently articulated. Thus, as much as society must pursue “deep decarbonization,” it also must facilitate adaptation just as intense and broad in scope—the pushback cannot be ignored.⁶⁹

This will be a new kind of challenge, one stemming from the “death of stationarity.”⁷⁰ For the most part, the controversies enveloping environmental law until now have mostly been about an “environment versus economy” rhetoric.⁷¹ Environmental law has long been cast by critics as the enemy of jobs⁷² and the enemy of property rights,⁷³ but rarely has it been condemned, even by its most ardent opponents, as the enemy of public health and safety. Sustainable development policy has been oriented towards using environmental law in concert with other legal regimes to create a long-term, win-win balance between environment, economy, and social equity. All of this policy work and controversy over implementation has taken place, however, under an assumption of relatively stable upper and lower boundaries of variability across relevant dimensions, such as

⁶⁹ Although it would provide an apt analogy, we intentionally have avoided using the term “deep adaptation” given the baggage that term has attracted following the release of a controversial holistic account of the need to adopt a “deep adaptation” agenda to avoid ecological collapse. See Jem Bendell, *Deep Adaptation: A Map for Navigating Climate Tragedy*, available at <https://www.lifeworth.com/deepadaptation.pdf>. The paper has yet to be published in a peer-reviewed journal but still has received considerable attention in the media. Like us, Bendell, a professor of sustainability at the University of Cumbria in the UK, questions the viability of sustainable development policy in its current form given the likelihood of exceeding 2°C. Our categories of nonlinear and shock adaptation resonate with Bendell’s idea of deep adaptation, but we have not endeavored in this chapter to assess Bendell’s claims and proposals. We plan in future work to do so.

⁷⁰ See generally Robin Kundis Craig, “Stationarity Is Dead”—*Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34:1 HARV. ENVTL. L. REV. 9 (March 2010); P. C. D. Milly, Julio Betancourt, Malin Falkenmark, Robert M. Hirsch, Zbigniew W. Kundzewicz, Dennis P. Lettenmaier, & Ronald J. Stouffer, *Stationarity Is Dead: Whither Water Management*, 319 SCIENCE 573 (2008).

⁷¹ Ian Carey, *The Great Economy Versus Environment Myth*, HUFFPOST, June 5, 2012, available at <https://www.huffingtonpost.com/ian-carey/the-great-economy-versus- b 1398439.html>.

⁷² Thomas J. Pyle, *Environmentalists’ Worst Enemy May Be Their Own Policies*, FORBES, Aug. 11, 2014, available at <https://www.forbes.com/sites/realspin/2014/08/11/environmentalists-worst-enemy-may-be-their-own-policies/#701bbae3a61d>.

⁷³ Roger Pilon, *Property Rights and Environmental Protection*, Cato Institute, June 27, 1995, available at <https://www.cato.org/publications/congressional-testimony/property-rights-environmental-protection>.

heat, flood, drought, and precipitation. That assumption of “stationarity” of variability bound will evaporate in the era of climate change adaptation. The assumptions underlying sustainable development and environmental law will go along with it.

What makes this future even more complex is that the measures needed to satisfy the rapidly increasing demand for adaptation will in many cases exacerbate the impacts to the environment and society already being meted out under business as usual in the Anthropocene. It would be challenging enough to manage sustainable development in the Anthropocene if the assumption of stationarity held true into the future, as if there were no climate change on the horizon. As adaptation to the no-analog future of non-stationarity becomes a rising necessity, many of the responses—moving agricultural lands, people, and water; hardening coastlines and riparian areas; genetically modifying crops and animals to withstand new conditions and to eradicate pests—will put new and intense pressures on the environment and society. If in fact the world entered the Anthropocene epoch with the rise of industrialization, it may soon be entering what could be thought of as its Adaptation Age. With that prospect in mind, two questions are of utmost importance for consideration today: (1) what will the “adaptation curve” look like, and (2) how can we start preparing for it now?

Contextualizing Adaptation Demand Curves

As the intensity of climate change impacts builds, what will people do about it? At one extreme, they will do nothing, ever. They will stay put and suffer the consequences. At the other extreme, they will immediately implement all adaptation measures needed to resist impacts predicted far into the future. Obviously, neither of these is a plausible scenario—people will not do nothing when their well-being is threatened, but they will not do everything *before* their well-being is threatened. The reality is going to be somewhere in between, and it will depend on the adaptation demand curve.

In its simplest model, the adaptation demand curve measures two variables. On the horizontal axis is the advance of a particular climate change impact, such as heat or sea-level rise. On the vertical axis is the demand for adaptation to the impact, which could come in the form of migration, hardening of infrastructure, or other responses.

Clearly, the mix of variables will produce complex variations of adaptation demand, but three core scenarios can be expected: (1) linear; (2) nonlinear; and (3) shock response.

Linear adaptation. Some climate change impacts may build over time in a fairly linear mode amenable to adaptation through incremental management tracking the progress of the impacts. For example, linear adaptation to sea-level rise could plan ahead by allowing for periodic expansion of levees or green infrastructure, which could take advantage of technological progress. There would be no need to build a seawall based on predictions of sea levels in 100 years if gradual and adaptive measures can be taken along the way. Of course, linear modes can be steep or gradual, and steep linear progression of impacts would require steep linear adaptation.

Nonlinear adaptation. Far more probable is that many climate change impacts, even if they appear linear at first, will take on nonlinear properties under which the impacts expand in scope and

intensity disproportionately over time.⁷⁴ For example, drought, heat, and flood regimes may increase in their rates of intensification over time. In such cases, linear adaptation's incremental approach could suddenly fall behind adaptation needs. Inflection points could put adaptation so far enough behind that catching up could be substantially more costly than had preparation taken the nonlinear properties into account. The problem is that predicting when inflection points occur and how fast rates of intensification increase on the other side is quite difficult.

Shock adaptation. Some climate change impacts will come on line more abruptly than will be felt under the linear and nonlinear modes. For example, the arrival and spread of dengue fever and malaria in the southern United States could take hold in a matter of several years. People will not awaken one day to find sea-level rises of a foot over the day before, but shock effects will feel like that. The adaptation response will need to move swiftly and decisively. Again, however, the problem is knowing when the shock is likely to occur, as standing ready indefinitely will be costly.

Although all of these possible scenarios have been experienced in the Anthropocene, for the most part governments constructed sustainability policy and environmental law around a relatively low-grade linear model with the assumption that the problem (pollution, habitat loss, species decline) could be incrementally halted and reversed, or at worst that it could be moved within the bounds of stationarity. Linear adaptation responses to such phenomena were believed to operate effectively. The Endangered Species Act is a classic example of this assumption: we identify a species in decline; we develop a recovery plan and intervene; the species recovers. Of course, it has not turned out to be that straightforward. Even before climate change became a factor, evidence of the "great acceleration" provided compelling evidence that the Anthropocene had moved many problems into a nonlinear mode, which likely will require response efforts that intensify in nonlinear intensity and cost as the problem progresses. Climate change will push yet more and more existing problems into nonlinear mode, and create new problems as well. And in some cases tipping points will impose sharp breaks in how the problem exacerbates. Adaptation demand will need to anticipate and follow these trajectories as well.

The bottom line is that, whereas we once lived in a world dominated by problems exhibiting linear behavior operating within the bounds of stationarity (or so we thought), we have entered an era that will be dominated by nonlinear and shock problems operating outside the bounds of historical stationarity. The confounding factor is that the impacts to society are as profound as to the environment. Under the linear model, problems like wetlands loss and species loss were handled through linear mitigation policies—we lose an acre of wetlands here, let's replace them with two acres there; that's not too much to ask of a development project; life went on. That is decisively *not* how nonlinear and shock problems work. When the viability of a particular crop to its historical growing region suddenly starts to plummet, or when a regional fishery succumbs to a migrating predator, or when heat in a city becomes intolerable, or when a community wakes up to find malaria a credible threat, there is no linear incremental response to pull out of the toolbox. People will demand action, big and fast. It is time to start preparing.

Preparing for Nonlinear and Shock Adaptation

⁷⁴ See [IPCC](#), GLOBAL WARMING OF 1.5 °C, *supra* note 41.

Before considering what can be done to prepare the sustainable development and environmental law regimes for the inevitable demand for nonlinear and shock adaptation, let's consider and dispense with the option of staying the course, fighting the fight, and not giving an inch. This would be a suicidal strategy. People whose health, safety, and security depend on rapid and robust adaptation measures—shoring up coastal barriers, eradicating disease bearing insects, controlling floods, protecting crops from new migrating pests, securing drinking water supplies—will have sharply diminished tolerance for waiting while policy makers conduct sustainability studies and environmental impact assessments. The question “what is sustainable” will be replaced with “what is survivable,” and actors developing survival strategies will not stop to brood over sustainability. Likewise, calls for protracted NEPA litigation, for avoiding all impacts to endangered species, for staying out of wetlands, for conserving water supplies, and for other environmental protection and conservation measures taken as a given today will fall on deaf ears. Giving no ground by behaving as if the climate adaptation demand for new infrastructure is like today's highway project, or as if the demand for deploying new pesticides is like today's FIFRA registration challenge, or as if the need to clear habitat for new agricultural land development or new infrastructure is like today's endangered species conflict, will be a sorely misguided strategy. This is not to say long-term thinking and environmental law must simply go away, but taking a hard line position of enforcing all existing environmental laws to the hilt will ignite a furious backlash that could open the door to a wholesale rollback of regulatory programs, and with broad and deep public support for doing so.

So the more realistic question to ask is what can sustainable development policy and environmental law do *now* to become more facilitative of climate change adaptation without sacrificing core values and goals? We do not want to throw the baby out with the bathwater. For sustainable development policy, adaptation must be amended to each of the goals as an explicit priority that must be factored in, even if it imposes trade-offs with what otherwise would have been the sustainable development pathway absent climate change. In short, sustainable development policy cannot assume that it will operate in a world held to below 2°C, and it may need to put some of the goals or their targets in suspension until adaptation provides a more secure foundation for resuming them.

For environmental law, several strategies seem viable and capable of being implemented under existing laws. The following descriptions of their core approaches use federal law as the medium for explanation, but they could be instituted at state and local levels as well.

Maximize connections to public health and safety. Although some corners of environmental law are closely tied to promoting public health, such as air pollution regulations, that connection has not often been drawn to natural resources programs such as the ESA and Section 404, and protecting public safety has generally not been a theme of environmental law. More could be done on this front. The ecosystem services theme that has gained prominence in the past two decades is aimed in this direction.⁷⁵ For example, wetlands provide water purification and groundwater recharge services as well as protection against inland flooding and coastal storm surges. Wherever it can be shown that robust protection of natural resources promotes climate change adaptation

⁷⁵ The Economics of Ecosystems & Biodiversity, *Ecosystem Services*, available at <http://www.teebweb.org/resources/ecosystem-services/>.

strategies, those connections should be made and widely advertised. This strategy can only go so far, however, as those connections must be shown to be real and credibly assessed.

Establish criteria for what qualifies as a climate change adaptation action. Clearly, not every action and project should be considered as furthering climate change adaptation, hence it will be important to establish a set of criteria for designating a project as truly serving necessary and urgent climate change adaptation and thus qualifying for the approaches outlined below. A multi-agency commission could be charged with evaluating which projects qualify. A presidential executive order likely could establish the commission, outline its goals, and direct executive agencies to use existing authorities to achieve them.

Embrace compensatory mitigation. Although compensatory mitigation already is deeply embedded in many programs, most prominently in Section 404 wetlands mitigation banking,⁷⁶ it needs to be expanded, simplified, and made widely available. Climate adaptation, especially shoring up or relocating built environment infrastructure, is going to have extensive impacts on natural resources, and holding to the strategies of avoid and minimize preferred in today's environmental programs will be problematic. Also, the Obama Administration's stated goal of having compensatory mitigation produce net environmental benefits, even when not required by law (it seldom is),⁷⁷ which the Trump Administration rescinded,⁷⁸ would be a magnet for opposition. Something closer to the ESA's "maximum extent practicable" standard for qualifying actions, which does not require full compensation (much less net benefits) could be workable.⁷⁹ Section 404 of the CWA itself imposes no standard; indeed, it does not mention mitigation⁸⁰ — Congress required the Corps to establish "performance standards" for mitigation in a 2004 military appropriations bill, but there also imposed no outcome standard.⁸¹ It may also be necessary to allow compensatory mitigation after the fact, so as to expedite necessary projects.

Expedite processes. Speaking of which, there already is a fierce debate over whether pre-decision impact assessment processes such as NEPA, ESA Section 7, and FIFRA registration take too long to complete and are too costly. That debate will only intensify as important adaptation measures are at stake. But mandatory page limits and time limits are not needed across the board, as the Trump Administration is pushing for.⁸² Rather, qualifying climate adaptation projects could be

⁷⁶ U.S. Environmental Protection Agency, *Wetlands Compensatory Mitigation Fact Sheet*, available at https://www.epa.gov/sites/production/files/2015-08/documents/compensatory_mitigation_factsheet.pdf.

⁷⁷ Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment, Nov. 3, 2015, available at <https://obamawhitehouse.archives.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related>.

⁷⁸ Executive Order 13783, 82 Fed. Reg. 16093 (Mar. 28, 2017), available at <https://www.federalregister.gov/documents/2017/03/31/2017-06576/promoting-energy-independence-and-economic-growth>.

⁷⁹ 16 U.S.C. § 1539(a)(2)(B)(ii).

⁸⁰ 33 U.S.C. § 1344.

⁸¹ Section 314 of the National Defense Authorization Act for Fiscal Year 2004, Pub. Law 108-136, available at <https://www.gpo.gov/fdsys/pkg/PLAW-108publ136/html/PLAW-108publ136.htm>.

⁸² White House, Fact Sheets, *President Donald J. Trump's Administration Is Improving Inefficient Permitting Reviews*, (Apr. 9, 2018), available at <https://www.whitehouse.gov/briefings-statements/president-donald-j-trumps-administration-improving-inefficient-permitting-reviews/>.

moved to an alternative consolidated impact assessment “fast track” under which one document would serve all such review programs, only “no action” and “proposed action” would be considered as the alternatives, and mandatory time frames would be in effect. Nothing in NEPA, Section 7 of the ESA, or Section 404 of the CWA precludes such an approach for land development projects. The respective agencies (CEQ, EPA, and Corps) could therefore promulgate regulations establishing this approach.

Leverage statutory substantive flexibility. Many of our current environmental laws actually are sufficiently flexible to allow regulators to scale back on controls and conditions where appropriate to facilitate important climate adaptation initiatives. For example, Section 404(b)(1) of the CWA, which authorizes EPA to promulgate water degradation guidelines for the Corps of Engineers’ issuance of Section 404 permits, does not establish any fixed standards or limits.⁸³ By cross-reference to Section 403(c),⁸⁴ it simply lists the types of effects the guidelines must address. And the EPA is authorized in Section 404(c) to veto a Corps permit only if it will result in an “unacceptable adverse effect” on any of several specified resources.⁸⁵ Similarly, FIFRA pesticide registration is held to a standard of not imposing “unreasonable adverse effects on the environment,” defined to require a cost-benefit analysis.⁸⁶ EPA very likely would have the authority to carve out qualifying climate change adaptation infrastructure projects and pesticide registrations for a specialized set of guidelines as to what are “unacceptable” and “unreasonable” environmental impacts. Even the ESA, often depicted as rigid and demanding, has room for flexing on behalf of climate adaptation projects. For example, given that it operates on a species-wide assessment scale, very few projects today result in the dreaded “jeopardy” finding under the interagency consultation provision of Section 7,⁸⁷ and the Section 10 permitting process for non-federal actions leaves ample room for using compensatory mitigation flexibly.⁸⁸

Institute “repair accounts” and “repair planning” to offset relaxed standards. The quid-pro-quo for all of the above could be to keep track of impacts that were not avoided, minimized, or mitigated because of the above measures and put them in a “repair account” tagged to the entities carrying out the project. A condition of the permits covering the project could be to develop a “repair plan” that would require fixing or compensating for those impacts in the future when it makes sense to do so. For example, repair efforts might not be prudent while temperatures are past 2°C and still rising, but may facilitate recovery of the affected resource once temperatures begin to stabilize or, ideally, to fall.

These and similar measures within reach under existing environmental laws may not provide enough “flex” to accommodate needed adaptation initiatives, in which case the statutory can of worms might need to be opened up. That prospect could be ugly for sustainable development policy and environmental law. It therefore behooves those interested in keeping environmental protection and conservation in play for adaptation policy to find creative ways of molding today’s

⁸³ 33 U.S.C. § 1344(b)(1).

⁸⁴ 33 U.S.C. § 1343(c).

⁸⁵ 33 U.S.C. § 1344(c).

⁸⁶ 7 U.S.C. § 136(bb).

⁸⁷ 16 U.S.C. § 1536(a)(2).

⁸⁸ 16 U.S.C. § 1539(a)(2).

environmental programs to meet tomorrow's climate adaptation needs while maintaining as many of the core goals in place as possible.

CONCLUSION

As we write this chapter, children plaintiffs are arguing to the U.S. Court of Appeals for the Ninth Circuit that the federal government of the United States owes them, constitutionally, a stable climate. Even if they win the case, however, the odds are increasingly good that neither the United States, nor the world of nations as a whole, will be able to deliver—not for a long, *long* time.

But the children's future doesn't have to be chaos. If in this chapter we outline a climate dystopia with apparent ease, it's to highlight and underscore the value of investing *now* in both the security of the planet and the security of the rule of law. Those two facets of human well-being have become inextricably interwoven as we risk the crossing of planetary boundaries into a planetary system state that no incarnation of *Homo* has ever seen.

In this context, trade-offs among the sustainable development spheres should *always* favor the environment—although, as numerous commentators have pointed out, many of the SDGs and targets are mutually achievable. We therefore suggest that re-prioritizing the environmental SDGs to the head of the line and re-characterizing them as the *primary* goals is a modest-sounding but absolutely critical initial re-organization of governance mindsets for the Anthropocene. Once that re-prioritization is firmly embedded in policy minds, climate change adaptation must be integrated into each goal as an overarching theme, in the hope that there is a “new normal” in our no-analog future to which adaptation will deliver us in good enough shape to resume pursuit of *all* the SDGs without basic survival hanging in the balance.