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Climate Justice in the Anthropocene and Its Relationship with Science and Technology: The Importance of Ethics of Responsibility

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Climate Justice in the Anthropocene and Its Relationship with Science and Technology: The Importance of Ethics of Responsibility

PAOLO DAVIDE FARAH & ALESSIO LO GIUDICE

Climate change is a global phenomenon. Therefore, globalization is the necessary hermeneutical horizon to develop an analysis of the metamorphosis climate change could cause at a political, social, and economic level. Within this horizon, this Article shows how the relationship between the concept of the Anthropocene epoch and the request for justice allows for framing a climate-justice and intergenerational equity-focused political interpretation of the effects of climate change. In order to avoid reducing such an interpretation to merely an ideological critique of capitalism, the conception of climate justice needs to be grounded in a rational, ethical model. This Article proposes that the ethics of responsibility, inspired by Hans Jonas's well-known philosophy, could work as a promising rational foundation for climate justice. The ethics of responsibility also align with the principles established by the study and analysis of the relationships between science, technology, and society.

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Climate Justice in the Anthropocene and Its Relationship with Science and Technology: The Importance of Ethics of Responsibility

PAOLO DAVIDE FARAH^{*†} & ALESSIO LO GIUDICE^{**}

“[T]he possibility of there being responsibility in the world, which is bound to the existence of men, is of all objects of responsibility the first.”¹

I. CLIMATE CHANGE AS A GLOBAL PHENOMENON

In September 2019, a meeting of the Intergovernmental Panel on Climate Change (IPCC) was held.² The IPCC is the United Nations body

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[†] Some of the research informing this project was initially funded by the People Programme (Marie Curie Actions) of the European Union’s Seventh Framework Programme under REA grant agreement n° 317767 as *Liberalism In Between Europe And China (LIBEAC): Assessing the Socio-Cultural and Politico-Legal Dimensions of the Differences in Terms of Interpretation and Enforcement of Economic, Social and Environmental Rights in Europe and China*, within the results of gLAWcal—Global Law Initiatives for Sustainable Development. The most recent version of this Article was completed during Professor Farah’s time as Visiting Scholar at University of Messina (April–August 2022), hosted by Professor Lo Giudice. The draft was also used as a conceptual paper to introduce and set the scope of the international conference on “Liberalism and Ecology in the Anthropocene,” held at University of Messina, June 30–July 2, 2022, chaired by the authors and organized in collaboration among the Interdisciplinary Research Collaborative on Global Challenges and Local Response Initiatives at West Virginia University’s Eberly College of Arts and Sciences, the European Society of International Law (ESIL) Interest Group on International Environmental Law, the ESIL Interest Group on International Legal Theory and Philosophy, and supported by the Italian Society of Philosophy of Law (SIFD), and the Italian Society of International Law (SIDI).

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¹ HANS JONAS, *THE IMPERATIVE OF RESPONSIBILITY: IN SEARCH OF AN ETHICS FOR THE TECHNOLOGICAL AGE* 99 (Univ. of Chi. Press 1984) (1979).

² Press Release, Intergovernmental Panel on Climate Change [IPCC], IPCC Opens Meeting to Consider Ocean and Cryosphere Report 1 (Sept. 20, 2019), <https://www.ipcc.ch/site/assets/uploads/2019/09/190919-Pr-P51-opening.pdf>. The IPCC was created in 1988 by the World Meteorological

that evaluates climate science; assesses the state of knowledge on climate change, its implications, and potential risks; and puts forward adaptation and mitigation options to counter the effects of climate change.³ IPCC reports provide scientific information that can assist and support governments and national authorities at all levels, including regions and cities, in addressing current relevant domestic climate and sustainability issues and in making well-informed science-based policy and law decisions.⁴ IPCC reports are also extremely productive in that they nourish conversations among countries and governments that are parties to the United Nations Framework Convention on Climate Change (UNFCCC).⁵ Based on research conducted by hundreds of scientists, the most recent report on glaciers and the ocean (known as the *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*), focuses on how pollution will affect both the climate and human life by the end of the century.⁶ A concerning issue documented in the report indicates that glacial melting and the increasing global temperature could lead to a much faster rise in sea levels than previous estimates.⁷ Further, the report indicates that from 2006 to 2015 the North and South Poles lost roughly 4 trillion metric tons of mass.⁸ Mountain glaciers are set to lose 280 million tons of mass a year, which in turn is likely to cause avalanches and water pollution.⁹ For example, the Mont Blanc

Organization (WMO) and the United Nations Environment Programme (UNEP). The IPCC is formed by the countries that are members of the U.N. and the WMO. *Id.*

³ See *id.* at 2.

⁴ On the role of IPCC and international environmental policy-making, see generally Kal Raustiala, *Nonstate Actors in the Global Climate Regime*, in *INTERNATIONAL RELATIONS AND GLOBAL CLIMATE CHANGE* 95 (Urs Luterbacher & Detlef F. Sprinz eds., 2001); Bernd Siebenhüner, *The Changing Role of Nation States in International Environmental Assessments—The Case of the IPCC*, 13 *GLOB. ENV'T CHANGE* 113 (2003); Silke Beck et al., *Towards a Reflexive Turn in the Governance of Global Environmental Expertise: The Cases of the IPCC and the IPBES*, 23 *GAIA: ECOLOGICAL PERSPS. FOR SCI. & SOC'Y* 80 (2014).

⁵ U.N. Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc. No. 102-38, 1771 U.N.T.S. 107. Regarding the importance of UNFCCC in the evolution of international environmental law, see E. Lisa F. Schipper, *Conceptual History of Adaptation in the UNFCCC Process*, 15 *REV. EUR. COMTY. & INT'L ENV'T L.* 82 (2006); Jutta Brunnée & Charlotte Streck, *The UNFCCC as a Negotiation Forum: Towards Common but More Differentiated Responsibilities*, 13 *CLIMATE POL'Y* 589 (2013); Lukas Hermwille et al., *UNFCCC Before and After Paris—What's Necessary for an Effective Climate Regime?*, 17 *CLIMATE POL'Y* 150 (2017). For an example of the IPCC's impact on international climate negotiations, see Paolo Davide Farah & Marek Prityi, *The Anthropocene and Climate Change in the Post-Paris Agreement Debate*, in *ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE* 198–99 (Anu Valtonen et al. eds., 2020) (discussing the IPCC's widely accepted definition of climate change).

⁶ *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*, at vii, 4–5, 92, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC] (Hans-Otto Pörtner et al. eds., 2019) [hereinafter IPCC].

⁷ *Id.* at 6–11.

⁸ *Id.* at 205–06, 212, 236–37; see also Andrew Shepherd et al., *A Reconciled Estimate of Ice-Sheet Mass Balance*, 338 *SCIENCE* 1183, 1183, 1188–89 (2012) (“Between 1992 and 2011, the ice sheets of Greenland, East Antarctica, West Antarctica, and the Antarctic Peninsula changed in mass by -142 ± 49 , $+14 \pm 43$, -65 ± 26 , and -20 ± 14 gigatonnes [per] year, respectively.”).

⁹ IPCC, *supra* note 6, at 18.

glacier complex was sliding at a rate of sixty centimeters a day in 2020, polluting its surroundings and causing severe geomorphological effects.¹⁰ Glaciers also contain toxic substances accumulated over the years of mostly anthropogenic origin, such as DDT, coal dust, and heavy metals that, if released into river water, will cause serious damage to the environment.¹¹

The literature covered in the Special Report also highlights the consequences of climate change. Even if the global low-emission target as set forth under the Paris Agreement¹² is reached by 2100, glaciers are still forecasted to lose at least eighteen percent of their mass compared to their 2015 level.¹³ For glaciers located in Central Europe and Asia, the estimate could be as high as eighty percent.¹⁴ Further, if the objectives¹⁵ of the Paris Agreement will not be met in 2100, then the global temperature will rise by four degrees Celsius,¹⁶ but a joint effort of the international community to reduce emissions could limit the increase to two degrees Celsius.¹⁷ Along

¹⁰ Elisa Anzolin & Francesca Piscioneri, *Mont Blanc Glacier at Risk of Collapse, PM Calls for Climate Action*, REUTERS, (Sept. 25, 2019, 7:22 AM), <https://www.reuters.com/article/us-italy-glacier-idUSKBN1WA1AF>; Stefan Schneiderbauer, *Statement on the Risk of Mont Blanc Glacier Collapse*, U.N. UNIV.: INST. FOR ENV'T & HUM. SEC. (Aug. 7, 2020), <https://ehs.unu.edu/news/news/statement-on-risk-of-mont-blanc-glacier-collapse.html>.

¹¹ See generally Christian Bogdal et al., *Blast from the Past: Melting Glaciers as a Relevant Source for Persistent Organic Pollutants*, 43 ENV'T SCI. & TECH. 8173 (2009).

¹² Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104, 3156 U.N.T.S. 3 [hereinafter Paris Agreement]. The Paris Agreement has been welcomed as an important milestone for the international community's fight against climate change and as a major political success. In the aftermath of the signing of the agreement, several commentators highlighted the innovative nature of the agreement in both its negotiation and on the nonbinding compliance system. See, e.g., Annalisa Savaresi, *The Paris Agreement: A New Beginning?*, 34 J. ENERGY & NAT. RES. L. 16 (2016); Robert Falkner, *The Paris Agreement and the New Logic of International Climate Politics*, 92 INT'L AFFS. 1107 (2016); Radoslav S. Dimitrov, *The Paris Agreement on Climate Change: Behind Closed Doors*, 16 GLOB. ENV'T POL. 1 (2016). The COVID-19 pandemic negatively affected the climate commitments of the parties of the Paris Agreement. John M. Reilly et al., *The COVID-19 Effect on the Paris Agreement*, 8 HUMANS. & SOC. SCIS. COMM'NS 1 (2021). Yet scholars underscore that the pandemic provided opportunities and funding for facilitating the energy transition. See, e.g., Arthur Wyns & Kim Robin van Daalen, Comment, *From Pandemic to Paris: The Inclusion of COVID-19 Response in National Climate Commitments*, 5 LANCET: PLANETARY HEALTH e256 (2021); Wolfgang Obergassel et al., *Harnessing International Climate Governance to Drive a Sustainable Recovery from the COVID-19 Pandemic*, 21 CLIMATE POL'Y 1298 (2021); Pedro R.R. Rochedo et al., *Is Green Recovery Enough? Analysing the Impacts of Post-COVID-19 Economic Packages*, 14 ENERGIES 5567 (2021).

¹³ IPCC, *supra* note 6, at 17.

¹⁴ *Id.*

¹⁵ The "well below 2°C" target has been set by a joint effort and multilateral cooperation in the scientific community. See Carl-Friedrich Schuessner et al., *Science and Policy Characteristics of the Paris Agreement Temperature Goal*, 6 NATURE CLIMATE CHANGE 827 (2016); Jannik Gieseckam et al., *Science-Based Targets: On Target?*, 13 SUSTAINABILITY 1657 (2021).

¹⁶ See IPCC, *supra* note 6, at 8 (projecting a 4.3°C global mean temperature increase by the end of the century in a scenario where there are high greenhouse gas emissions and no policies to mitigate climate change).

¹⁷ Meinshausen et al. assess that if all the renewed pledges to reduce emissions under the Paris Agreement's National Determined Contributions are achieved, the objective of limiting the rise in global

with the melting of glaciers and increasing global temperature, sea levels could rise roughly eighty-four centimeters, potentially subjecting more than four percent of the global population to regular flooding and other extreme weather events.¹⁸

The report underlines the global nature of human-induced¹⁹ climate change. The effects of climate change are not limited to a single state but instead spread across the globe with a wide array of interdependent factors. At an empirical level, climate change is closely interconnected with the globalization phenomenon.²⁰ If we look at the relationship between global production processes, supply chains, and business decisions²¹ regarding manufacturing sites, the pervasiveness of climate change becomes clear. Rising awareness in the global community of the negative effects of climate change and the approaching sustainability crisis²² invite reflection upon the need to set up political structures capable of governing phenomena that have a global scope and that cannot, consequently, be simply governed at the

temperature below 2°C could be met. Malte Meinshausen et al., *Realization of Paris Agreement Pledges May Limit Warming Just Below 2 °C*, 604 NATURE 304 (2022). For a discussion about the United States rejoining the Paris Agreement, see Daniel Bodansky, *Climate Change: Reversing the Past and Advancing the Future*, 115 AM. J. INT'L L. UNBOUND 80 (2021).

¹⁸ See IPCC, *supra* note 6, at 55–56, 328, 376.

¹⁹ The increase in extreme events is being attributed to human-induced climate change. See Daniel L. Swain et al., *Attributing Extreme Events to Climate Change: A New Frontier in a Warming World*, 2 ONE EARTH 522 (2020); Michael Goss et al., *Climate Change Is Increasing the Likelihood of Extreme Autumn Wildfire Conditions Across California*, 15 ENV'T RSCH. LETTERS, Aug. 2020, art. 094016; Quirin Schiermeier, *Climate as Culprit*, 560 NATURE 20 (2018); A. Park Williams et al., *Observed Impacts of Anthropogenic Climate Change on Wildfire in California*, 7 EARTH'S FUTURE 892 (2019); Duanyang Xu et al., *Assessing the Relative Role of Climate Change and Human Activities in Desertification of North China from 1981 to 2010*, 13 FRONTIERS EARTH SCI. 43 (2019).

²⁰ The intricate relationship between economic globalization and climate change has been extensively analyzed in the literature. See Karen L. O'Brien & Robin M. Leichenko, *Double Exposure: Assessing the Impacts of Climate Change Within the Context of Economic Globalization*, 10 GLOB. ENV'T CHANGE 221 (2000); Maoliang Bu et al., *Globalization and Climate Change: New Empirical Panel Data Evidence*, 30 J. ECON. SURVS. 577 (2016); Michael Jakob, *Globalization and Climate Change: State of Knowledge, Emerging Issues, and Policy Implications*, 13 WIRES CLIMATE CHANGE e771 (2022); Anthony J. McMichael, *Globalization, Climate Change, and Human Health*, 368 NEW ENG. J. MED. 1335 (2013); Bradley C. Parks & J. Timmons Roberts, *Globalization, Vulnerability to Climate Change, and Perceived Injustice*, 19 SOC'Y & NAT. RES. 337 (2006).

²¹ Corporations' behavior and operations, especially in the Global South, are under more and more scrutiny. International law could be a possible avenue to address the negative effects of transnational corporations on human rights in general and environmental protection specifically. For a general analysis on such a connection, see BUSINESS AND HUMAN RIGHTS IN EUROPE: INTERNATIONAL LAW CHALLENGES (Angelica Bonfanti ed., 2019) [hereinafter BUSINESS AND HUMAN RIGHTS IN EUROPE]. See also Danielle Anne Pamplona & Julia Stefanello Pires, *Prevention and Remediation Possibilities in Climate Litigation Against Corporations in Brazil*, 55 CONN. L. REV. 861 (2023).

²² See Paolo Davide Farah, *Sustainable Development Goals in Europe and Their Intersection with the Business & Human Rights Framework*, in BUSINESS AND HUMAN RIGHTS IN EUROPE, *supra* note 21, at 10; Paolo Davide Farah, *Los Objetivos de Desarrollo Sostenible en Europa y su Intersección con el Marco de los Negocios y los Derechos Humanos*, [Sustainable Development Objectives in Europe and its Intersection with the Framework of Business and Human Rights], 15 REVISTA DE DIREITO INTERNACIONAL 190 (2018) (Braz.).

national level.²³ Thus, globalization is the central theoretical and interpretative background of this paper, which Part II will embrace as a starting point to reflect on political, social, and economic shifts caused by climate change and the ever-evolving related consensus. Next, Part III analyzes the relationship between the Anthropocene epoch and the concept of climate justice, intended here as a framework for the political interpretation of the effects of climate change.²⁴ Finally, drawing on the concept of the ethics of responsibility introduced by Hans Jonas, Part IV integrates rationality into the current climate justice framework.

II. GLOBALIZATION, MULTILATERALISM, AND THE ROLE OF SCIENCE AND TECHNOLOGY

In the midst of the COVID-19 pandemic, the cover of *The Economist's* May 16, 2020, issue could not have come with a more emblematic title: “Goodbye globalisation. The dangerous lure of self-sufficiency.”²⁵ One of the editorials, titled “Has COVID-19 killed globalisation?,” highlights how there is a new propensity for self-sufficiency and the closure of borders around the world, to the point that “some 90% of people live in countries with largely closed borders.”²⁶ According to that same editorial, the consequence of the pandemic on globalization is that the movement of people, goods, and capital has suffered a vertical decline, probably unprecedented.²⁷ On a similar note, a few weeks earlier, French President Emmanuel Macron had declared that he considered the COVID-19 pandemic “an existential event for humanity that will change the nature of globalisation and the structure of international capitalism,” according to the *Financial Times*.²⁸ In addition, during the same period, President Trump reiterated during an interview with *Fox Business* that the severe impact of COVID-19 on international economic policy showed that the era of

²³ See Paolo Davide Farah & Piercarlo Rossi, *National Energy Policies and Energy Security in the Context of Climate Change and Global Environmental Risks: A Theoretical Framework for Reconciling Domestic and International Law Through a Multiscalar and Multilevel Approach*, 20 EUR. ENERGY & ENV'T L. REV. 232 (2011).

²⁴ Farah & Prityi, *supra* note 5.

²⁵ ECONOMIST, May 16, 2020, <https://www.economist.com/weeklyedition/2020-05-16> (last visited Apr. 18, 2023).

²⁶ Editorial, *Has Covid-19 Killed Globalisation?*, ECONOMIST, May 14, 2020, <https://www.economist.com/leaders/2020/05/14/has-covid-19-killed-globalisation>.

²⁷ *Id.* (“World goods trade may shrink by 10–30% this year. In the first ten days of May exports from South Korea, a trade powerhouse, fell by 46% year-on-year, probably the worst decline since records began in 1967.”).

²⁸ Victor Mallet & Roula Khalaf, *FT Interview: Emmanuel Macron Says It Is Time to Think the Unthinkable*, FIN. TIMES (Apr. 16, 2020), <https://www.ft.com/content/3ea8d790-7fd1-11ea-8fdb-7ec06edeef84>.

globalization was “over.”²⁹ In short, the impression is that these somewhat apocalyptic considerations on the systemic effects of the COVID-19 pandemic should be reviewed from a standpoint reflecting, in a more analytical way, at least two fundamental types of globalization (and multilateralism): economic and political. A brief analysis of these two manifestations of globalization, connected but at the same time distinct, allows more generally a reflection on the relationships between individuals and an environment profoundly changed as a result of climate change.

Regarding the economic aspect, globalization is, first and foremost, a way to strengthen interdependence up to the point of exhaustion at the economic level. This is made possible by advances in science and technology. It would not be possible to understand the expansion of the globalization phenomenon and of global capital if we fail to consider the importance of science and in particular the technological revolutions in the transportation sector and in the information and communication technologies (ICT). Within ICT, it is important to consider the development of recent technologies such as artificial intelligence, big data, and blockchain,³⁰ and the consequent reduction of trade costs (mostly in logistics and transportation).³¹ Globalization is, therefore, a product of science and technology, supported in its development by political choices favorable to

²⁹ Fox Business, *Trump Talks Michael Flynn, Obama Admin and China with Maria Bartiromo*, YOUTUBE, at 33:29 (May 14, 2020), <https://youtu.be/U-7N8HAKWmc> (“So you have globalists, . . . they’re people that think we need to make the world wealthy at our expense, . . . but those days are over. And if nothing else, over the last two months, it’s been proven to be right.”).

³⁰ See Paolo Davide Farah & Marek Prityi, *Public Administration in the Age of Globalization and Emerging Technologies: From Theories to Practice*, 88 UMKC L. REV. 397 (2019).

³¹ Reduction of trade costs is a key focus of the latest multilateral agreement reached under the auspices of the World Trade Organization in 2013: the Trade Facilitation Agreement (TFA). See General Council, *Protocol Amending the Marrakesh Agreement Establishing the World Trade Organization*, WTO Doc. WT/L/940 (Nov. 27, 2014) (entered into force Feb. 22, 2017). The TFA was the first agreement signed after the 2001 Doha Deadlock and seeks to reduce non-tariff barriers to trade and smooth trade flow across the globe. On the genesis of the agreement, see Nora Neufeld, *The Long and Winding Road: How WTO Members Finally Reached a Trade Facilitation Agreement* (WTO Staff Working Paper, Paper No. ERSD-2014-06, 2014), https://www.wto.org/english/res_e/reser_e/ersd201406_e.pdf. For an assessment of the TFA, see Bernard Hoekman, *The Bali Trade Facilitation Agreement and Rulemaking in the WTO: Milestone, Mistake, or Mirage?*, in *THE WORLD TRADE SYSTEM: TRENDS AND CHALLENGES* 149 (Jagdish N. Bhagwati et al. eds., 2016); Antonia Eliason, *The Trade Facilitation Agreement: A New Hope for the World Trade Organization*, 14 *WORLD TRADE REV.* 643 (2015). China-led development and infrastructure strategy, the Belt and Road Initiative (BRI), is giving new impetus to trade facilitation. On the relationship between trade facilitation and the BRI, see Bala Ramasamy & Matthew C.H. Yeung, *China’s One Belt One Road Initiative: The Impact of Trade Facilitation Versus Physical Infrastructure on Exports*, 42 *WORLD ECON.* 1673 (2019); Marcus Bartley Johns et al., World Bank Grp. [WBG], MTI Discussion Paper No. 4, *Trade Facilitation Challenges and Reform Priorities for Maximizing the Impact of the Belt and Road Initiative* (2018), <https://openknowledge.worldbank.org/bitstream/handle/10986/30477/129935-MTI-Discussion-Paper-4.pdf>; Joanne Waters, “Unimpeded Trade” in *Central Asia – A Trade Facilitation Challenge*, in *THE BELT AND ROAD INITIATIVE: LAW, ECONOMICS, AND POLITICS* 375 (Julien Chaisse & Jędrzej Górski, eds., 2018); Feng Weijiang, *Trade Facilitation Agreement of WTO with the Belt and Road Initiative*, in *ROUTLEDGE HANDBOOK OF THE BELT AND ROAD* 97 (Cai Fang & Peter Nolan eds., 2019).

the liberalization of international trade. These political choices, in turn, have found impetus and fulfillment in the favorable geopolitical context that arose following the fall of the Berlin Wall and the rise of the Washington Consensus³² in international relations. When framed as a product of science and technology, the process of economic globalization is often described as irreversible.³³ This might be true, but when we refer to its economic or political projections, such as free trade on one side and multilateralism on the other, it is arguable that globalization is not set in stone and can be reversed eventually, as these projections, along with freedom and liberties, can be very important liberalism principles. If we carefully examine the directions and policies of some of the largest economies in the world, such as the United States, China, or the European Union,³⁴ recent support for unilateralism, independence, and self-reliance, as seen in the border closure and division resulting from the pandemic, might be considered the better method for re-establishing the power balance and dynamic in a globalized post-Cold War era.³⁵ Although the interconnection between the different world economies at the technological and infrastructural level is certainly the product of fifty years of investments and organizational choices of transnational elites that are unlikely to be so easily undermined by legislative act or any political decision, this does not mean that a new political reality

³² The hegemonic position of the United States in the global order is constantly under fire. China's resurgence in the international economic order has sparked discussions among scholars regarding the current phase and its alignment or not with what is often referred to as Western values. The "Beijing consensus" is presented as an alternative to the prevailing dominance of, in particular, the United States and, in general, the "West" in global governance institutions. On the debate, see Yasheng Huang, *Debating China's Economic Growth: The Beijing Consensus or the Washington Consensus*, 24 *ACAD. MGMT. PERSPS.* 31 (2010); Yang Yao, *Beijing Consensus or Washington Consensus: What Explains China's Economic Success?*, 13 *DEV. OUTREACH* 26 (2011); Galchu Jarso, *The Beijing Consensus Versus the Washington Consensus: The Dilemma of Chinese Engagement in Africa*, 12 *AFR. J. POL. SCI. & INT'L RELS.* 1 (2018); Scott Kennedy, *The Myth of the Beijing Consensus*, 19 *J. CONTEMP. CHINA* 461 (2010); Wang Jisi, *The Plot Against China?: How Beijing Sees the New Washington Consensus*, *FOREIGN AFFS.*, July/Aug. 2021, at 48.

³³ The literature on globalization is, of course, endless. Here it is, at the very least, necessary to refer to two "classics." ULRICH BECK, *WHAT IS GLOBALIZATION?* (Patrick Camiller trans., Polity Press 2018) (1997); ZYGMUNT BAUMAN, *GLOBALIZATION: THE HUMAN CONSEQUENCES* (1998).

³⁴ See INT'L MONETARY FUND, *WORLD ECONOMIC OUTLOOK: COUNTERING THE COST-OF-LIVING CRISIS* xiii (2022).

³⁵ The crisis of multilateralism, while not new, seems to have reached a point where regionalism is taking a leading role in structuring power relations. See Jutta Brunnée, *Multilateralism in Crisis*, 112 *AM. SOC'Y INT'L L. ANN. MEETING* 335, 335–39 (2018); EDWARD NEWMAN, *A CRISIS IN GLOBAL INSTITUTIONS? MULTILATERALISM AND INTERNATIONAL SECURITY* (2007); Claude Ake, *Globalization, Multilateralism, and the Shrinking Democratic Space*, in *FUTURE MULTILATERALISM: THE POLITICAL AND SOCIAL FRAMEWORK* (Michael G. Schechter ed., 1999); José E. Alvarez, *Multilateralism and Its Discontents*, 11 *EUR. J. INT'L L.* 393 (2000); Peter Lloyd, *Multilateralism in Crisis*, 8 *J. MONEY & ECON.*, Spring 2013, at 67; Esther Barbé, *Multilateralism Matters More than Ever*, 23 *GLOB. SOC'Y* 191 (2009); Thomas Renard, *Partnerships for Effective Multilateralism? Assessing the Compatibility Between EU Bilateralism, (Inter-)Regionalism and Multilateralism*, 29 *CAMBRIDGE REV. INT'L AFFS.* 18 (2016).

that scales back globalization and multilateralism's reach into domestic policy is not possible,³⁶ as the pandemic's impact shows.

The logic of science and technology is deemed to prevail, however, because it has generated a process rooted in the organizational structure of global value chains. The epistemological purpose of science and technology is, in fact, its own enhancement. Living in the era of advanced science and technology, we all understand how the latter is not driven by predetermined goals but rather by the internal logic of a self-powering discourse increasingly accelerated by the results achieved. It is reasonable to assume that this dynamic, once triggered, cannot be effectively hampered by the momentary political reactions to the pandemic.³⁷ The globalization that refers specifically to science and technology has such a profound impact on the social sphere that political choices that, in theory, are capable of putting globalization on hold are highly unlikely. Humans, who have been since the very start of civilization *homo technologicus*,³⁸ today are even more or less consciously embedded with advanced technology and frame their understanding of reality via that technology. Humans rely on science and technology, not only in the speculative processes of financial capitalism but also in daily activities that assume technological interconnection at a global level is unavoidable. This is certainly not a new phenomenon but is a key tenant of civilization. Science and technology, in fact, are always present in shaping our way of being humans.³⁹ Thus, on the economic side of science and technology, it is fair to say that the requiem of globalization appears difficult to justify. On the political side, science and technology's effect on multilateralism still must be assessed through additional stress tests and monitoring of domestic policies that will be adopted in the years to come.

What can be said about the political side? This side of the globalization coin must be associated, above all, with the range of experiences related to

³⁶ For a critical review of how to restructure the existing system in order to overcome global challenges such as climate change, see MARGARET STOUT & JEANNINE M. LOVE, *A RADICALLY DEMOCRATIC RESPONSE TO GLOBAL GOVERNANCE: DYSTOPIAN UTOPIAS* (2016) [hereinafter STOUT & LOVE, *DYSTOPIAN UTOPIAS*]; MARGARET STOUT & JEANNINE M. LOVE, *INTEGRATIVE GOVERNANCE: GENERATING SUSTAINABLE RESPONSES TO GLOBAL CRISES* (2019).

³⁷ See, e.g., MARTIN HEIDEGGER, *THE QUESTION CONCERNING TECHNOLOGY AND OTHER ESSAYS* (William Lovitt trans., 1977); EMANUELE SEVERINO, *IL DESTINO DELLA TECNICA [THE FATE OF TECHNOLOGY]* (2011) (It.); UMBERTO GALIMBERTI, *PSICHE E TECHNE: L'UOMO NELL'ETÀ DELLA TECNICA [PSYCHE AND TECHNE: MAN IN THE AGE OF TECHNOLOGY]* (1999) (It.).

³⁸ See generally MICHEL PUECH, *HOMO SAPIENS TECHNOLOGICUS* (2008) (Fr.).

³⁹ For masterful descriptions of the role of technology from anthropological and philosophical perspectives, see ARNOLD GEHLEN, *MAN IN THE AGE OF TECHNOLOGY* (Patricia Lipscomb trans., 1980) (1957); CARLO SINI, *L'UOMO, LA MACCHINA, L'AUTOMA: LAVORO E CONOSCENZA TRA FUTURO PROSSIMO E PASSATO REMOTO [The Man, the Machine, the Automaton: Work and Knowledge Between the Near Future and the Remote Past]* (2009) (It.).

multilateralism and so-called “global governance.”⁴⁰ Regardless of the historical genesis and legal frameworks, several global governance institutions are aimed at coordinating political choices at a multilateral level. For this reason, global governance institutions⁴¹ such as the World Trade Organization (WTO), World Health Organization (WHO), International Labour Organization (ILO), International Monetary Fund (IMF), World Bank, and the Internet Corporation for Assigned Names and Numbers (ICANN), are political expressions of globalization.⁴² Yet, by looking at the most recent cases, namely the economic crisis of 2008 and, of course, the health crisis of 2020, the inability of global governance institutions to govern amid global challenges appears starkly clear.⁴³ The case of climate change is even more emblematic, as demonstrated by the inability of the United Nations to effectively deal with environmental degradation.⁴⁴ All this leads us to maintain that economic globalization does not correspond to an adequate level of political multilateralism capable of governing phenomena of social importance that are increasingly taking place at the global level. Attempts to strengthen the political dimension of economic globalization, so far, have failed. There are many factors and reasons at the institutional and structural levels that can explain this failure. First, the prevalence of an economic approach to social and cultural advancements in the globalization discourse has inspired the activity of most of global governance institutions to date.⁴⁵ This approach has reduced the possibility to affirm, at a global level, the primacy of non-trade concerns (NTCs) over economic profits.⁴⁶ Second,

⁴⁰ The literature on this concept is now vast. For their precious reconstructive character and for the depth of the analysis, see generally GOVERNANCE WITHOUT GOVERNMENT: ORDER AND CHANGE IN WORLD POLITICS (James N. Rosenau & Ernst-Otto Czempiel eds., 1992); MODERN GOVERNANCE: NEW GOVERNMENT-SOCIETY INTERACTIONS (Jan Kooiman ed., 1993); ANTONINO PALUMBO & SALVO VACCARO, GOVERNANCE: TEORIE, PRINCIPI, MODELLI, PRATICHE NELL'ERA GLOBALE [GOVERNANCE: THEORIES, PRINCIPLES, MODELS, PRACTICES IN THE GLOBAL AGE] (2007); MARIA ROSARIA FERRARESE, LA GOVERNANCE TRA POLITICA E DIRITTO [GOVERNANCE BETWEEN POLITICS AND LAW] (2010); ALBERTO ANDRONICO, VIAGGIO AL TERMINE DEL DIRITTO [JOURNEY TO THE END OF THE LAW] (2012).

⁴¹ For an analysis of what has been labelled as institutions of globalization, see MARIA ROSARIA FERRARESE, LE ISTITUZIONI DELLA GLOBALIZZAZIONE. DIRITTO E DIRITTI NELLA SOCIETÀ TRANSNAZIONALE [INSTITUTIONS OF GLOBALIZATION: LAW AND RIGHTS IN TRANSNATIONAL SOCIETY] (2000).

⁴² See generally BENEDICTE BULL & DESMOND MCNEILL, DEVELOPMENT ISSUES IN GLOBAL GOVERNANCE: PUBLIC-PRIVATE PARTNERSHIPS AND MARKET MULTILATERALISM (2015).

⁴³ See, e.g., Marina Larinova & Jon Kirton, *Global Governance After the COVID-19 Crisis*, 15 INT'L ORGS. RSCH. J. 7 (2020); Ian Goldin & Tiffany Vogel, *Global Governance and Systemic Risk in the 21st Century: Lessons from the Financial Crisis*, 1 GLOB. POL'Y 4 (2010).

⁴⁴ See, e.g., Pamplona & Pires, *supra* note 21; Richard Kinley et al., *Beyond Good Intentions, to Urgent Action: Former UNFCCC Leaders Take Stock of Thirty Years of International Climate Change Negotiations*, 21 CLIMATE POL'Y 593, 599–600 (2021).

⁴⁵ See Paolo Davide Farah, *Foreword* to GLOBAL VALUES AND INTERNATIONAL TRADE LAW (Csongor István Nagy ed., 2022).

⁴⁶ For more information on the role of NTCs in international economic law, see Paolo Davide Farah, *Trade and Progress: The Case of China*, 30 COLUM. J. ASIAN L. 51 (2016); CHINA'S INFLUENCE ON

we often confront a lack of political control, particularly democratic control, and accountability in the global decision-making processes that affect our lives.⁴⁷ This is precisely because the only effective political institutions capable of coping with global challenges have remained anachronistically anchored at the national level. According to some commentators, the COVID-19 pandemic and the consequent inability to address it at a global level—as shown, for example, by the evanescent actions of the WHO—has done nothing but confirm the delay on the political level of the globalization processes.⁴⁸ At this level, there is no trace of a truly global policy, what Jürgen Habermas has repeatedly described as a world domestic policy.⁴⁹

When we use the word “globalization,” we actually often refer to the political consequences of globalization, which is multilateralism (as opposed to unilateralism). Globalization and multilateralism sometimes overlap such that they are used interchangeably. Other times, they are not referring to the same theoretical concepts or to the same causes and effects. Multilateralism, as a system to address global challenges, relies on a wide array of state and non-state actors, often with conflicting priorities and interests.⁵⁰ Power dynamics, as well as a particular ideology underlying the core theoretical assumptions, together play a role in shaping the core interests of a supposedly unified international community. The idea that global challenges, such as environmental degradation, could be meaningfully addressed by this community is unrealistic. The rise of emerging economies coupled with the development of an intricate web of transnational corporations,⁵¹ due to the global expansion of capital,⁵² were bringing new impetus and innovative ideas to reframe the conduct of multilateral actors well before the spread of COVID-19.

The COVID-19 pandemic, envisaged here as a crisis in the coherence of international priorities, demonstrates how key tenants of multilateralism—trust, cooperation, and transparency—are drastically downplayed in favor of a return to unilateralism (antagonism, secrecy, and distrust). Specifically,

NON-TRADE CONCERNS IN INTERNATIONAL ECONOMIC LAW (Paolo Farah & Elena Cima eds., 2016); *see also* Farah, *supra* note 45.

⁴⁷ Paolo Davide Farah, *Foreword to* TECHNOCRACY AND THE LAW: ACCOUNTABILITY, GOVERNANCE AND EXPERTISE (Alessandra Arcuri & Florin Coman-Kund eds., 2021).

⁴⁸ Lee Jones & Shahar Hameiri, *COVID-19 and the Failure of the Neoliberal Regulatory State*, 29 REV. INT’L POL. ECON. 1027 (2022); Marin Larionova & John Kirton, *Global Governance After the COVID-19 Crisis*, 15 INT’L ORG. RSCH. J. 7 (2020). *Contra* MARTIN WOLF, WHY GLOBALIZATION WORKS (2004).

⁴⁹ This topic is addressed in a skillful manner in JÜRGEN HABERMAS, THE POSTNATIONAL CONSTELLATION: POLITICAL ESSAYS (Max Pensky ed. & trans., Polity Press 2001) (1998).

⁵⁰ *See* Robert O. Keohane, *Multilateralism: An Agenda for Research*, 45 INT’L J. 731, 737–38 (1990) (“Multilateralism can be defined as the practice of co-ordinating national policies in groups of three or more states, through *ad hoc* arrangements or by means of institutions.”).

⁵¹ *See generally* BUSINESS AND HUMAN RIGHTS IN EUROPE, *supra* note 21.

⁵² *See* Milan Babic et al., *The Rise of Transnational State Capital: State-Led Foreign Investment in the 21st Century*, 27 REV. INT’L POL. ECON. 433, 434, 453–54 (2020).

countries across the globe prioritized closing borders, affirming national sovereignty, and protecting national citizens rather than the underserved as responses to the pandemic.⁵³ The situation regarding vaccinations followed a similar path. Ultimately, constraint of the pandemic was achieved by those developed countries who managed to secure from pharmaceutical corporations a number of doses that outweighed their overall population.⁵⁴ For the least developed countries, however, the situation continues. Internal dysfunctionalities of multilateralism characterize not only the vaccination phase, but also the amount of financing and resources available to respond to the pandemic. A recent study points out that multilateral institutions such as the IMF have been hesitant to provide much-needed liquidity to developing countries and that the “world community is failing to deliver its own assessment of current gaps and is falling far short of doing ‘whatever it takes.’”⁵⁵ The COVID-19 pandemic has also furthered a reconfiguration of the traditional balance of power in multilateral institutions. China, India, and Russia highlighted the failure of multilateral institutions to provide global public health protection and equitable access to medicine, not only as a consequence of COVID-19 but also, in previous negotiations regarding access to medicine.⁵⁶ At the same time, rather than confronting the issue at a multilateral level, these countries moved in a sparse and unorganized way to promote national interests abroad in what has been termed “vaccine diplomacy.”⁵⁷ The European Union and the United States were acting in a similar manner in internally reviewing vaccines (sourced from China and Russia) already deemed to be safe for emergency use by the WHO.⁵⁸ Further, the United States never approved Vaxzevria, which comes from a company in the European Union.⁵⁹ Since the Congress of Vienna, multilateral

⁵³ See Florian Bieber, *Global Nationalism in Times of the COVID-19 Pandemic*, 50 NAT’YS PAPERS 13 (2022); Benjamin Opratko et al., *Cultures of Rejection in the Covid-19 Crisis*, 44 ETHNIC & RACIAL STUD. 893 (2021).

⁵⁴ European Commission Press Release IP/21/2548, *Coronavirus: Commission Signs a Third Contract with BioNTech-Pfizer for an Additional 1.8 Billion Doses* (May, 20 2021), https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2548 (“[T]he European Commission signed a third contract with the pharmaceutical companies BioNTech and Pfizer. It reserves an additional 1.8 billion doses on behalf of all EU Member States, between end 2021 to 2023.”).

⁵⁵ Thomas Stubbs et al., *Whatever It Takes? The Global Financial Safety Net, Covid-19, and Developing Countries*, WORLD DEV., Jan. 2021, art. 105171, at 7.

⁵⁶ Khan Sharun & Kuldeep Dhama, *COVID-19 Vaccine Diplomacy and Equitable Access to Vaccines amid Ongoing Pandemic*, 52 ARCHIVES MED. RSCH. 761, 761–63 (2021); Jayashree Watal, *Public Health, Intellectual Property Rights, and Developing Countries’ Access to Medicines*, in CHINA’S INFLUENCE ON NON-TRADE CONCERNS IN INTERNATIONAL ECONOMIC LAW, *supra* note 46, at 502.

⁵⁷ Sharun & Dhama, *supra* note 56, at 761–63.

⁵⁸ Mark P. Lythgoe & Paul Middleton, *Comparison of COVID-19 Vaccine Approvals at the US Food and Drug Administration, European Medicines Agency, and Health Canada*, JAMA NETWORK OPEN, June 2021, at 1, 1–3.

⁵⁹ AstraZeneca withdrew its application to sell Vaxzevria in the U.S. after still awaiting approval in November 2022. Angus Liu, *AstraZeneca Withdraws US COVID Vaccine Application, Shifts Focus to Antibody Treatments*, FIERCE PHARMA (Nov. 10, 2022, 9:55 AM), <https://www.fiercepharma.com/pharma/astrazeneca-withdraws-us-covid-vaccine-application-focus-shifts-antibody-treatments>.

institutions have been established precisely in order to address global challenges to public health.⁶⁰ Yet without trust, cooperation, and transparency amongst its members, an alternative to multilateralism should at least be researched and considered.

Moreover, the year 2020 might be remembered as an additional step toward a continued loss of trust in the expertise of technocrats globally.⁶¹ If we look at the management of COVID-19 by the WHO and the slow and contradictory position of its Director General, Tedros Adhanom, the problem of accountability appears to be the most prevalent issue.⁶² Since February 2020, the emergence of COVID-19 and the WHO's controversial role in what has been defined as an international fiasco has been debated,⁶³ while numerous casualties have continued to emerge and the number of deaths has increased.⁶⁴ This took place despite WHO experts telling the entire world that there was no reason to panic, and then those same experts changed their opinions months later once the pandemic had become truly global.⁶⁵ In addition, these same experts have constantly issued guidelines and opinions that are continually criticized by other experts.⁶⁶ Those critics and negative commentators should concede their understanding of the difficult position and work of the WHO at the intersection of expertise and geopolitics, and the challenge of operating within a legal framework with its own limitations.⁶⁷

Multiple countries expressed their dissatisfaction with the role played by the WHO, while still others called for the resignation of the WHO director, but only the United States decided to withdraw its funding from the

⁶⁰ Bob Reinalda, *From the Congress of Vienna to Present-Day International Organizations*, U.N.: U.N. CHRON. (Dec. 2014), <https://www.un.org/en/chronicle/article/congress-vienna-present-day-international-organizations>.

⁶¹ Technocracy has always been debated by social movements. Robert Howse, *From Politics to Technocracy and Back Again: The Fate of the Multilateral Trading Regime*, 96 AM. J. INT'L L. 94 (2002); TECHNOCRACY AND THE LAW: ACCOUNTABILITY, GOVERNANCE AND EXPERTISE, *supra* note 47.

⁶² The case of face masks is an example of the different positions taken by the WHO during the health crisis. See Editorial, *World Health Coronavirus Disinformation*, WALL ST. J. (Apr. 5, 2020, 5:28 PM), <https://www.wsj.com/articles/world-health-coronavirus-disinformation-11586122093>.

⁶³ See, e.g., Hai Yang, *Contesting Legitimacy of Global Governance Institutions: The Case of the World Health Organization During the Coronavirus Pandemic*, 23 INT'L STUD. REV. 1813, 1813–15 (2021).

⁶⁴ As of April 26, 2023, the WHO has recorded 764,474,387 global COVID-19 cases and 6,915,286 deaths. *WHO Coronavirus (COVID-19) Dashboard*, WORLD HEALTH ORG., <https://covid19.who.int/table> (last visited Apr. 26, 2023).

⁶⁵ See, e.g., Jacqueline Howard, *WHO Stands by Recommendation to Not Wear Masks if You Are Not Sick or Not Caring for Someone Who Is Sick*, CNN (Mar. 31, 2020, 2:24 AM), <https://www.cnn.com/2020/03/30/world/coronavirus-who-masks-recommendation-trnd/index.html>; *World Health Coronavirus Disinformation*, *supra* note 62.

⁶⁶ For an overview of the problems faced by the WHO to counteract the pandemic, see British Inst. of Int'l and Compar. L., *Webinar: COVID-19 and International Law: What Went Wrong and What Can We Learn from It?*, YOUTUBE (Apr. 17, 2020), <https://www.youtube.com/watch?v=d-IRZ6WPiCI>.

⁶⁷ Christopher M. Weible et al., *COVID-19 and the Policy Sciences: Initial Reactions and Perspectives*, 53 POL'Y SCIS. 225, 228, 234 (2020).

organization.⁶⁸ The position of the United States should also be assessed in light of the anti-multilateral tendency of the Trump administration, as expressed by the withdrawal from the 2016 Paris Agreement on climate change.⁶⁹ The Biden administration reversed both of these decisions on its first day in office.⁷⁰

States did not do well in this pandemic either.⁷¹ In fact, similarly, at a national level, virologists led the political conversation not only on COVID-19, but also, most alarmingly, on other aspects far from their expertise. An agreement, even on basic points such as the need of wearing facemasks, was slow in coming, resulting in visible confusion and apprehension among citizens.⁷² Aside from virologists, others such as journalists and economists, offered their expertise regarding COVID-19 and presented themselves as the most appropriate actors to manage the long-term effects of the pandemic.⁷³ Do we really need these unaccountable experts (of any discipline) changing their minds based on political opportunities?

Furthermore, while some countries adopted one opinion of experts and entire nations quarantined as a result (like France, Italy, Spain, and the United Kingdom), other nations, like Sweden, continued business as usual with the objective of establishing herd immunity, also in accordance with other expert opinions.⁷⁴ No matter which expert was followed, each strategy resulted in the loss of life. It is not known which decision was the “correct”

⁶⁸ *World Health Coronavirus Disinformation*, *supra* note 62; Zachary Keyser, *Petition Calling for Resignation of WHO Director-General Nears 720k Signatures*, JERUSALEM POST (Apr. 5, 2020, 1:22 PM), <https://www.jpost.com/international/petition-calling-for-resignation-of-who-director-general-nears-720k-signatures-623626>; Katie Rogers and Apoorva Mandavilli, *Trump Administration Signals Formal Withdrawal from W.H.O.*, N.Y. TIMES (July 7, 2020), <https://www.nytimes.com/2020/07/07/us/politics/coronavirus-trump-who.html>.

⁶⁹ Thomas G Weiss, *The UN and Multilateralism Under Siege in the “Age of Trump.”* 4 GLOB. SUMMITRY 1 (2018).

⁷⁰ *See Fact Sheet: President-Elect Biden’s Day One Executive Actions Deliver Relief for Families Across America amid Converging Crises*, WHITE HOUSE (Jan. 20, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/fact-sheet-president-elect-bidens-day-one-executive-actions-deliver-relief-for-families-across-america-amid-converging-crises/>. For an analysis of the first 100 days in office and the importance of environmental protection, see SONJA THIELGES, KONRAD ADENAUER STIFTUNG E. V. NO. 438, *BIDEN’S CLIMATE AGENDA: DOMESTIC POLICY SCOPE AND POTENTIAL ARENAS FOR TRANSATLANTIC COOPERATION* (2021), https://publications.rifs-potsdam.de/rest/items/item_6001098_5/component/file_6001100/content, and for the health sector, see Joanne Silberner, *How Joe Biden Has Changed US Healthcare in Just 100 Days*, BMJ, Apr. 29, 2021.

⁷¹ Andrea Lavazza & Mirko Farina, *The Role of Experts in the Covid-19 Pandemic and the Limits of Their Epistemic Authority in Democracy*, FRONTIERS IN PUB. HEALTH, July 2020, at 1, 2.

⁷² *See* Howard, *supra* note 65.

⁷³ *See* Ezra Klein, *The Covid Policy That Really Mattered Wasn’t a Policy*, N.Y. TIMES (Feb. 6, 2022), <https://www.nytimes.com/2022/02/06/opinion/covid-pandemic-policy-trust.html> (discussing the Covid-19 policies and practices in the United States and contemplating a “good pandemic policy” for a “low-trust, high-dysfunction society”).

⁷⁴ Rachel Elisabeth Irwin, *Misinformation and De-Contextualization: International Media Reporting on Sweden and COVID-19*, GLOBALIZATION & HEALTH, July 2020, at 1, 10.

choice. Were there other suggestions that could have been adopted by the experts? Maybe. Would it have led to a better outcome? It is unclear.

This is just one example of how experts and technocrats making decisions related to governance have either made bad decisions or simply did not know which the best decision was to take, despite their expertise. In fact, new issues emerged as a result of great disagreements between experts and technocrats. While experts such as doctors were pushing for the adoption of policies that save lives, technocrats at the government level were looking to avoid a great economic disaster and loss of jobs.⁷⁵ This only further complicated the decision-making process at state and supranational levels, where the decision of closing entire airports and borders was made only after the disaster occurred.⁷⁶ All these issues bring to light another fundamental question: How do we effectively deal with the limits of expert knowledge in a crisis situation created by a new pandemic?

The global pandemic has, more than ever before, made it clear among nonexperts and general public opinion that the role of experts in the policy and regulation-making process is the cornerstone of society in our contemporary world.⁷⁷ Because of the effects of globalization, the decisions of governments and international organizations have an enormous impact on communities and citizens throughout the world. The global pandemic has just reminded us that barriers and walls might give the impression, to part of the public opinion, of being protected from what is unknown and “alien.” As for fighting against climate change, the challenges of mitigation cannot be underestimated, nor solved by one country alone; rather, they require a global effort. Moreover, public health is a matter that needs a global coalition to promote scientific collaboration and exchange among experts and scientists around the world to protect each and every community and family for the common future we share on this Earth.

⁷⁵ See, e.g., Josh Arslan & Thomas Suen, *China's Zero-COVID Policies Save Lives - But Not Livelihoods*, REUTERS (Oct. 14, 2022, 12:24 PM), <https://www.reuters.com/world/china/chinas-zero-covid-policies-save-lives-not-livelihoods-2022-10-14/>

⁷⁶ See, e.g., Council Recommendation 2020/1475 of Oct. 13, 2020, On a Coordinated Approach to the Restriction of Free Movement in Response to the COVID-19 Pandemic, 2020 O.J. (L 337/3); Suspension of Entry as Immigrants and Nonimmigrants of Persons Who Pose a Risk of Transmitting 2019 Novel Coronavirus and Other Appropriate Measures To Address This Risk, Proclamation No. 9984, 3 C.F.R., at 34 (2021).

⁷⁷ The rise of populist movements is often explained in part by the loss of connection between governing institutions and politicians with the layman. Aversion to technocrats and experts are found in different fields, such as economics and science. See, e.g., Luigi Guiso et al., *Global Crises and Populism: The Role of Eurozone Institutions*, 34 ECON. POL'Y 95 (2019); Luboš Pástor & Pietro Veronesi, *Inequality Aversion, Populism, and the Backlash Against Globalization*, 76 J. FIN. 2857 (2021); Dani Rodrik, *Populism and the Economics of Globalization*, 1 J. INT'L BUS. POL'Y 12 (2018); Niels G. Mede & Mike S. Schäfer, *Science-Related Populism: Conceptualizing Populist Demands Toward Science*, 29 PUB. UNDERSTANDING SCI. 473, 473–74 (2020).

III. THE ANTHROPOCENE AS A FRAMEWORK FOR THE POLITICAL INTERPRETATION OF THE EFFECTS OF CLIMATE CHANGE

A. *The Great Acceleration of the Anthropocene*

As previously addressed, especially in the case of COVID-19,⁷⁸ the analysis of globalization⁷⁹ is connected with the relationship among humans, science, and technology and the ability of that science and technology to affect human action.⁸⁰ In this sense, the background of globalization is an inescapable interpretative reference for adequately questioning climate change as an agent of economic, social, and legal change.⁸¹ In order to

⁷⁸ Daniel D. Bradlow & Stephen Kim Park, *A Global Leviathan Emerges: The Federal Reserve, COVID-19, and International Law*, 114 AM. J. INT'L L. 657 (2020); Andrew DeWit et al., *An Integrated Approach to Sustainable Development, National Resilience, and COVID-19 Responses: The Case of Japan*, INT'L J. DISASTER RISK REDUCTION, Dec. 2020, at 1; Stuti Khemani, World Bank Grp. [WBG], Rsch. & Pol'y Briefs No. 32, *An Opportunity to Build Legitimacy and Trust in Public Institutions in the Time of COVID-19* (2020), <https://openknowledge.worldbank.org/bitstream/handle/10986/33715/An-Opportunity-to-Build-Legitimacy-and-Trust-in-Public-Institutions-in-the-Time-of-COVID-19.pdf>; Dilys Roe et al., *Beyond Banning Wildlife Trade: COVID-19, Conservation and Development*, WORLD DEV., Dec. 2020, at 1; Lavanya Rajamani & Jacqueline Peel, *Changing Context, Emerging Trends, and Expanding Frontiers*, in THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW (Lavanya Rajamani & Jacqueline Peel eds., 2d ed. 2021); Nicole Lurie et al., *Developing Covid-19 Vaccines at Pandemic Speed*, 382 NEW ENG. J. MED. 1969 (2020).

⁷⁹ See, e.g., Thomas Richard Davies, *A "Great Experiment" of the League of Nations Era: International Nongovernmental Organizations, Global Governance, and Democracy Beyond the State*, 18 GLOB. GOVERNANCE 405 (2012); DAVID KENNEDY, *A WORLD OF STRUGGLE: HOW POWER, LAW, AND EXPERTISE SHAPE GLOBAL POLITICAL ECONOMY* (2016); Linda Weiss, *Globalization and State Power*, 29 DEV. & SOC'Y 1 (2000); DANI RODRIK, *HAS GLOBALIZATION GONE TOO FAR?* (1997); Abdul Noury & Gerard Roland, *Identity Politics and Populism in Europe*, 23 ANN. REV. POL. SCI. 421 (2020); ERIC SHEPPARD, *LIMITS TO GLOBALIZATION: THE DISRUPTIVE GEOGRAPHIES OF CAPITALIST DEVELOPMENT* (2016); Olivier Butzbach et al., *Manufacturing Discontent: National Institutions, Multinational Firm Strategies, and Anti-Globalization Backlash in Advanced Economies*, 10 GLOB. STRATEGY J. 67 (2020); *NORMATIVE READINGS OF THE BELT AND ROAD INITIATIVE: ROAD TO NEW PARADIGMS* (Wenhua Shan et al. eds., 2018); Teemu Ruskola, *People, Inc.? Law, Economic Enterprise, and the Development of Inequality in China*, 67 AM. J. COMPAR. L. 383 (2019); Alvaro Cuervo-Cazurra et al., *Skepticism of Globalization and Global Strategy: Increasing Regulations and Countervailing Strategies*, 10 GLOB. STRATEGY J. 3 (2020).

⁸⁰ Literature on the intersection of science, technology, and society is extensive. See, e.g., STATES OF KNOWLEDGE: THE CO-PRODUCTION OF SCIENCE AND THE SOCIAL ORDER (Sheila Jasanoff ed., 2004); Sheila Jasanoff, *Serviceable Truths: Science for Action in Law and Policy*, 93 TEX. L. REV. 1723 (2015); Philip L. Boreano, Comment, *Saving Us From Ourselves: The Interaction of Law and Science-Technology*, 47 DENV. L.J. 671 (1970); Simon A. Cole & Alyse Bertenthal, *Science, Technology, Society, and Law*, 13 ANN. REV. L. & SOC. SCI. 351 (2017).

⁸¹ Ulrich Beck labels the changes as a metamorphosis, denoting the coexistence of several factors, and in his thought-provoking book traces the path forward. ULRICH BECK, *THE METAMORPHOSIS OF THE WORLD: HOW CLIMATE CHANGE IS TRANSFORMING OUR CONCEPT OF THE WORLD* (2016). Adaptation is increasingly preferred to mitigation, denoting the need to take for granted some of the changes induced by humans. Also, adaptation discussions challenge the practicability of the approach. See W. Neil Adger, *Social Capital, Collective Action, and Adaptation to Climate Change*, 79 ECON. GEOGRAPHY 387 (2003); W. Neil Adger et al., *Are There Social Limits to Adaptation to Climate Change?*, 93 CLIMATIC CHANGE 335 (2009); Barry Smit & Olga Pilifosova, Intergovernmental Panel on Climate Change [IPCC],

improve understanding of climate change,⁸² globalization, along with science and technology,⁸³ should be taken as an interpretative reference to shed light on the relationships between humans and non-humans in society.⁸⁴ Humans have developed at such extent their relationships with technology⁸⁵

Adaptation to Climate Change in the Context of Sustainable Development and Equity, in CLIMATE CHANGE 2001: IMPACTS, ADAPTATION, & VULNERABILITY (James J. McCarthy et al. eds., 2001), https://www.ipcc.ch/site/assets/uploads/2018/03/WGII_TAR_full_report-2.pdf; Jeanne X. Kasperson & Roger E. Kasperson, *Vulnerability to Global Environmental Change*, in 2 THE SOCIAL CONTOURS OF RISK: RISK ANALYSIS, CORPORATIONS & THE GLOBALIZATION OF RISK 245 (2005).

⁸² Elisa Morgera & Annalisa Savaresi, *A Conceptual and Legal Perspective on the Green Economy*, 22 REV. EUR. CMTY. & INT'L ENV'T L. 14 (2013); Peter Eddie Aldinger, *Addressing Environmental Justice Concerns in Developing Countries: Mining in Nigeria, Uganda and Ghana*, 26 GEO. INT'L ENV'T L. REV. 345 (2014); Rajamani & Peel, *supra* note 78; André Nollkaemper, *Compliance Control in International Environmental Law: Traversing the Limits of the National Legal Order*, 13 Y.B. INT'L ENV'T L. 165 (2002); Nils Goeteyn & Frank Maes, *Compliance Mechanisms in Multilateral Environmental Agreements: An Effective Way to Improve Compliance?*, 10 CHINESE J. INT'L L. 791 (2011); Schipper, *supra* note 5; BRADLY J. CONDON, ENVIRONMENTAL SOVEREIGNTY AND THE WTO: TRADE SANCTIONS AND INTERNATIONAL LAW (2006); Klaus Bosselmann et al., *Enabling a Flourishing Earth: Challenges for the Green Economy, Opportunities for Global Governance*, 21 REV. EUR. CMTY. & INT'L ENV'T L. 23 (2012); Max Valverde Soto, Note, *General Principles of International Environmental Law*, 3 ILSA J. INT'L & COMPAR. L. 193 (1996); Joyeeta Gupta & Nadia Sanchez, *Global Green Governance: Embedding the Green Economy in a Global Green and Equitable Rule of Law Polity*, 21 REV. EUR. CMTY. & INT'L ENV'T L. 12 (2012); Terry L. Anderson & J. Bishop Grewell, *It Isn't Easy Being Green: Environmental Policy Implications for Foreign Policy*, *International Law, and Sovereignty*, 2 CHI. J. INT'L L. 427 (2001); Farah & Rossi, *supra* note 23; Fernando Cardozo Fernandes Rei, *International Environmental Law and Global Environmental Governance: Southern Influences*, 15 VEREDAS DO DIREITO 143 (2018); PHILIPPE SANDS ET AL., PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW (3d ed. 2012); John H. Knox, *The Global Pact for the Environment: At the Crossroads of Human Rights and the Environment*, 28 REV. EUR. COMPAR. & INT'L ENV'T L. 40 (2019); Owen McIntyre, *The Role of Customary Rules and Principles of International Environmental Law in the Protection of Shared International Freshwater Resources*, 46 NAT. RES. J. 157 (2006); Tuula Honkonen, *The Principle of Common but Differentiated Responsibility in Post-2012 Climate Negotiations*, 18 REV. EUR. CMTY. & INT'L ENV'T L. 257 (2009); Daniel Iglesias Márquez, *The Green Side of the International Codes of Conduct for Business* (Maastricht Sch. of Mgmt., Working Paper No. 2014/24, 2014).

⁸³ Kathryn Furlong, *STS Beyond the "Modern Infrastructure Ideal": Extending Theory by Engaging with Infrastructure Challenges in the South*, 38 TECH. SOC'Y 139 (2014); Cole & Bertenthal, *supra* note 80; Steve Woolgar & Javier Lezaun, *The Wrong Bin Bag: A Turn to Ontology in Science and Technology Studies?*, 43 SOC. STUD. SCI. 321 (2013); Daniele Caramani, *Will vs. Reason: The Populist and Technocratic Forms of Political Representation and Their Critique to Party Government*, 111 AM. POL. SCI. REV. 54 (2017); THE HANDBOOK OF SCIENCE AND TECHNOLOGY STUDIES (Sheila Jasanoff et al. eds., rev. ed. 1995).

⁸⁴ Paolo Davide Farah, *The Role of Imagination, Marginalized Communities, Law and Technology in Building an Ethical Approach to the Anthropocene*, in ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5, at 211 (Anu Valtonen et al. eds., 2020); Anu Valtonen & Outi Rantala, *Introduction: Reimagining Ways of Talking About the Anthropocene*, in ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5, at 1; Giovanni Frigo, *Beyond the Capitalocene: An Ecocentric Perspective for the Energy Transition*, in ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5, at 150.

⁸⁵ For an analysis of the dependency paradigm and the negative impact of technology on human development that often escape human control, see Peter Haff, *Humans and Technology in the Anthropocene: Six Rules*, 1 ANTHROPOCENE REV. 126 (2014); Sabri M. Saidam, *On Route to an E-Society: Human Dependence on Technology and Adaptation Needs* (2011) (unpublished manuscript)

(and science) that humans have become a product of their very own technology, as demonstrated by the most evident examples of Artificial Intelligence and big data.⁸⁶ The pandemic has shown how the rapid diffusion and spread of COVID-19 was mainly due to technological advancements in the field of transportation and in the creation of interdependencies of global society.⁸⁷ Technology is the main vehicle of the pandemic because, as a technological product, it gives life to economic and productive activities without borders and globally interconnects them from a technical point of view.⁸⁸ This has led to increases with respect to mobility,⁸⁹ transport,⁹⁰ exposure to new or unfamiliar substances, and human interactions. The fertile soil of global interdependence cannot, in its general scope, be “governed” by any traditional state or regional subject. This, as previously anticipated, reveals the structural political delay of the globalization processes.⁹¹ But in the same way, science and technology

(on file with author). Thomas Hughes takes a more critical stance and demonstrates how some of the threats have been always present in the relation between humans and technology. THOMAS P. HUGHES, *HUMAN-BUILT WORLD: HOW TO THINK ABOUT TECHNOLOGY AND CULTURE* (2004).

⁸⁶ Regulation of emerging technologies and their governance is greatly discussed in the literature, especially its relationship with ethics. On A.I., see STUART RUSSELL, *HUMAN COMPATIBLE: ARTIFICIAL INTELLIGENCE AND THE PROBLEM OF CONTROL* (2019). On Big Data, see Wolfgang Hoffmann-Riem, *Artificial Intelligence as a Challenge for Law and Regulation*, in *REGULATING ARTIFICIAL INTELLIGENCE* (Thomas Wischmeyer & Timo Rademacher eds., 2020); Corinne Cath, *Governing Artificial Intelligence: Ethical, Legal and Technical Opportunities and Challenges*, *PHIL. TRANSACTIONS ROYAL SOC’Y A*, Nov. 28, 2018, art. 20180080; Zarina I. Khisamova et al., *On Methods to Legal Regulation of Artificial Intelligence in the World*, 9 *INT’L J. INNOVATIVE TECH. & EXPLORING ENG’G* 5159 (2019); Matthew U. Scherer, *Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies*, 29 *HARV. J.L. & TECH.* 353 (2016); Richard Kemp, *Legal Aspects of Managing Big Data*, 30 *COMPUT. L. & SEC. REV.* 482 (2014); W. Nicholson Price II & I. Glenn Cohen, *Privacy in the Age of Medical Big Data*, 25 *NATURE MED.* 37 (2019); Ugo Pagallo, *The Legal Challenges of Big Data: Putting Secondary Rules First in the Field of EU Data Protection*, 3 *EUR. DATA PROT. L. REV.* 36 (2017).

⁸⁷ Migration and in general the increased mobility due to globalization have both been considered important factors driving the initial spread of the pandemic. Ibrahim Sirkeci & M. Murat Yüceşahin, *Coronavirus and Migration: Analysis of Human Mobility and the Spread of COVID-19*, 17 *MIGRATION LETTERS* 379 (2020); Matan Yechezkel et al., *Human Mobility and Poverty as Key Drivers of COVID-19 Transmission and Control*, *BMC PUB. HEALTH*, Mar. 25, 2021, at 1. The restrictions have also been analyzed, highlighting the uneven consequences on the various lockdown measures put in place at the onset of the pandemic. See Giovanni Bonaccorsi et al., *Economic and Social Consequences of Human Mobility Restrictions under COVID-19*, 117 *PROC. NAT’L ACAD. SCIS.* 15530 (2020); Angran Li et al., *Human Mobility Restrictions and Inter-Provincial Migration During the COVID-19 Crisis in China*, 53 *CHINESE SOCIO. REV.* 87 (2021); Smriti Rao et al., *Human Mobility, COVID-19, and Policy Responses: The Rights and Claims-Making of Migrant Domestic Workers*, 27 *FEMINIST ECON.* 254 (2021).

⁸⁸ See Sirkeci & Yüceşahin, *supra* note 87; Bonaccorsi et al., *supra* note 87.

⁸⁹ Sirkeci & Yüceşahin, *supra* note 87; Bonaccorsi et al., *supra* note 87; HIGHWAYS AND HIERARCHIES: ETHNOGRAPHIES OF MOBILITY FROM THE HIMALAYA TO THE INDIAN OCEAN (Luke Heslop & Galen Murton eds., 2021); Yechezkel et al., *supra* note 87; Li et al., *supra* note 87; Rao et al., *supra* note 87.

⁹⁰ The role of critical infrastructures is central to the international agenda. China has been particularly active on the topic by supporting the Belt and Road Initiative infrastructure development. See Furlong, *supra* note 83.

⁹¹ Mauro Bussani, *Deglobalizing Rule of Law and Democracy: Hunting Down Rhetoric Through Comparative Law*, 67 *AM. J. COMPAR. L.* 701 (2019).

were also the solutions to the problem in that less than one year after the appearance of COVID-19, scientific advances managed to respond through the use of vaccines.

The prevailing techno-global⁹² trait of the pandemic allows us to identify the areas to further explore for understanding how to interpret phenomenon such as climate change. It is precisely the relationships between humans and non-humans⁹³ that we should look at and specifically how these relationships have been consolidated by technological advancement—a relationship evidently distorted for the needs of the forces of production and for the lifestyle that, consequently, belongs to us. The relationship of human domination over the environment is increasingly counterproductive for the very survival of human life.⁹⁴ The environment through which the virus spread is not an abstract, untouched, and natural environment but has been created and formalized by humans—an environment historically produced by humans and for human purposes in the quest for modernization.⁹⁵ This

⁹² See generally Farah, *supra* note 47; Howse, *supra* note 61; OPENSTREETMAP IN GISCIENCE (Jamal Jokar Arsanjani et al. eds., 2015); Alessandra Arcuri & Federica Violi, *Reconfiguring Territoriality in International Economic Law*, 2016 NETH. Y.B. OF INT'L L. 175 (Martin Kuijter & Wouter Werner eds., 2017); THOMAS BIEBRICHER, *THE POLITICAL THEORY OF NEOLIBERALISM* (2018); JEAN-FRANÇOIS LYOTARD, *THE POSTMODERN CONDITION: A REPORT ON KNOWLEDGE* (Geoff Bennington & Brian Massumi trans., 1984); TRANSNATIONAL GOVERNANCE AND CONSTITUTIONALISM (Christian Joerges et al. eds. 2004); Caramani, *supra* note 83.

⁹³ Political ecology, a geography subdiscipline, specifically analyzes this relation. See generally Arturo Escobar, *Difference and Conflict in the Struggle Over Natural Resources: A Political Ecology Framework* 49 DEVELOPMENT 6 (2006); Tyler Harlan, *Green Development or Greenwashing? A Political Ecology Perspective on China's Green Belt and Road*, 62 EURASIAN GEOGRAPHY & ECON. 202 (2021); Anthony Bebbington, *Underground Political Ecologies: The Second Annual Lecture of the Cultural and Political Ecology Specialty Group of the Association of American Geographers*, 43 GEOFORUM 1152 (2012); R.A. Clapp, *Wilderness Ethics and Political Ecology: Remapping the Great Bear Rainforest*, 23 POL. GEOGRAPHY 839 (2004); Lisa M. Campbell, *Local Conservation Practice and Global Discourse: A Political Ecology of Sea Turtle Conservation*, 97 ANNALS ASS'N AM. GEOGRAPHERS 313 (2007); Farhana Sultana, *Political Ecology I: From Margins to Center*, 45 PROGRESS HUM. GEOGRAPHY 156 (2021); Tim Forsyth, *Political Ecology and the Epistemology of Social Justice*, 39 GEOFORUM 756 (2008); Matthew D. Turner, *Political Ecology II: Engagements with Ecology*, 40 PROGRESS HUM. GEOGRAPHY 413 (2016); PAUL ROBBINS, *POLITICAL ECOLOGY: A CRITICAL INTRODUCTION* (2d ed. 2012); Raymond L. Bryant, *Political Ecology: An Emerging Research Agenda in Third-World Studies*, 11 POL. GEOGRAPHY 12 (1992); THE ROUTLEDGE HANDBOOK OF POLITICAL ECOLOGY (Tom Perreault et al. eds., 2015).

⁹⁴ Paolo D. Farah, *Foreword to SUSTAINABILITY AND PEACEFUL COEXISTENCE FOR THE ANTHROPOCENE* (Pasi Heikkurinen ed., 2017).

⁹⁵ On China and the quest for modernity, see ANGANG HU ET AL., *2050 CHINA: BECOMING A GREAT MODERN SOCIALIST COUNTRY* (2021); GIOVANNI ARRIGHI, *ADAM SMITH IN BEIJING: LINEAGES OF THE TWENTY-FIRST CENTURY* (2007); Leïla Choukroune, *Book Review*, 61 CHINA PERSPS. 85 (Peter Brown trans., 2004) (reviewing ASIAN DISCOURSES OF RULE OF LAW (Randall Peerenboom ed., 2004)); WEIDONG JI, *BUILDING THE RULE OF LAW IN CHINA: PROCEDURE, DISCOURSE AND HERMENEUTIC COMMUNITY* (2017); Quan Li & Min Ye, *China's Emerging Partnership Network: What, Who, Where, When and Why*, 3 INT'L TRADE, POLS. & DEV. 66 (2019); DEBATING POLITICAL REFORM IN CHINA: RULE OF LAW VS. DEMOCRATIZATION (Suisheng Zhao ed., 2006); Qi Zhong, *Ecology: Clean, Clear Waters and Lush Mountains, "Gold and Silver Mountain," in THE CHINESE DREAM AND ZHEJIANG'S*

environment facilitates pollution and destruction of global commons, jumps of viruses between different species which, together with manipulation of fauna, generate infectious diseases transmitted by animals.⁹⁶ Deforestation also enables widespread diffusion of viruses.⁹⁷

Consequently, because of COVID-19 or other infectious diseases that could appear in the future,⁹⁸ the need to balance sustainable development⁹⁹ and globalization¹⁰⁰ has become even more important and perfectly fits into

PRACTICE—GENERAL REPORT VOLUME, at 187 (Yingqiu Liu et al. eds., 2019); SAMULI SEPPANEN, IDEOLOGICAL CONFLICT AND THE RULE OF LAW IN CONTEMPORARY CHINA: USEFUL PARADOXES (2016); Weidong Liu & Michael Dunford, *Inclusive Globalization: Unpacking China's Belt and Road Initiative*, 1 AREA DEV. & POL. 323 (2016); POLITICS OF THE 'OTHER' IN INDIA AND CHINA: WESTERN CONCEPTS IN NON-WESTERN CONTEXTS (Lion König & Bidisha Chaudhuri eds., 2016); Suisheng Zhao, *The China Model: Can It Replace the Western Model of Modernization?*, 19 J. CONTEMP. CHINA 419 (2010); WANG HUI, THE END OF THE REVOLUTION: CHINA AND THE LIMITS OF MODERNITY (Rebecca Karl trans., 2011); THE LIMITS OF THE RULE OF LAW IN CHINA (Karen G. Turner et al. eds., 2000).

⁹⁶ See S. Lakshmi Priyadarsini et al., *What We Can Learn from Previous Pandemics to Reduce the Frequency of Emerging Infectious Diseases Like COVID-19?*, 2 GLOB. TRANSITIONS 202, 216–17 (2020).

⁹⁷ RODRICK WALLACE ET AL., CLEAR-CUTTING DISEASE CONTROL: CAPITAL-LED DEFORESTATION, PUBLIC HEALTH AUSTERITY, AND VECTOR-BORNE INFECTION (2018).

⁹⁸ Ruiyun Li et al., *Substantial Undocumented Infection Facilitates the Rapid Dissemination of Novel Coronavirus (SARS-CoV-2)*, 368 SCIENCE 489 (2020).

⁹⁹ For an overview on how sustainability is framed under the U.N. system and in particular its Sustainable Development Goals (SDGs), see 21ST CENTURY COOPERATION: REGIONAL PUBLIC GOODS, GLOBAL GOVERNANCE, AND SUSTAINABLE DEVELOPMENT (Antoni Esteveadeordal & Louis W. Goodman eds., 2017); Gerald G. Singh et al., *A Rapid Assessment of Co-Benefits and Trade-Offs Among Sustainable Development Goals*, 93 MARINE POL'Y 223 (2018); Michelle A. Mycoo, *Achieving SDG 6: Water Resources Sustainability in Caribbean Small Island Developing States Through Improved Water Governance*, 42 NAT. RES. F. 54 (2018); DeWit et al., *supra* note 78; Roe et al., *supra* note 78; Hania Lincoln Lenderking et al., *Climate Change and Food Security in Caribbean Small Island Developing States: Challenges and Strategies*, 28 INT'L J. SUSTAINABLE DEV. & WORLD ECOLOGY 238 (2021); Natasha Affolder, *Contagious Environmental Lawmaking*, 31 J. ENV'T L. 187 (2019); Rafael Pérez-Escamilla, *Food Security and the 2015–2030 Sustainable Development Goals: From Human to Planetary Health*, CURRENT DEV. NUTRITION, July 2017, at 1; ELKE HERRFAHRDT-PÄHLE ET AL., GERMAN DEV. INST., DISCUSSION PAPER 15/2019, FRESHWATER AS A GLOBAL COMMONS: INTERNATIONAL GOVERNANCE AND THE ROLE OF GERMANY (2019), https://www.idos-research.de/uploads/media/DP_15.2019.pdf; Gokul Iyer et al., *Implications of Sustainable Development Considerations for Comparability Across Nationally Determined Contributions*, 8 NATURE CLIMATE CHANGE 124 (2018); Heloise Weber, *Politics of 'Leaving No One Behind': Contesting the 2030 Sustainable Development Goals Agenda*, 14 GLOBALIZATIONS 399 (2017); Ugo Mattei, *Protecting the Commons: Water, Culture, and Nature: The Commons Movement in the Italian Struggle Against Neoliberal Governance*, 112 S. ATL. Q. 366 (2013); David Lempert, *Testing the Global Community's Sustainable Development Goals (SDGs) Against Professional Standards and International Law*, 18 CONSILIENCE 111 (2017); Yuanbo Li & Xufeng Zhu, *The 2030 Agenda for Sustainable Development and China's Belt and Road Initiative in Latin America and the Caribbean*, 11 SUSTAINABILITY 2297 (2019); Joachim Monkelbaan, *Using Trade for Achieving the SDGs: The Example of the Environmental Goods Agreement*, 51 J. WORLD TRADE 575 (2017).

¹⁰⁰ See generally Paolo Davide Farah, *L'Unione europea e i valori non commerciali nel sistema globale degli scambi [European Union and Non-Trade Concerns in the World Trading System]*, in CITTADINANZA EUROPEA E DIRITTI UMANI [EUROPEAN CITIZENSHIP AND HUMAN RIGHTS] 103 (2018) (It.); Paolo Davide Farah, *Foreword to EU AND CARICOM: DILEMMAS VERSUS OPPORTUNITIES ON DEVELOPMENT, LAW AND ECONOMICS*, at ix (Alicia Elias-Roberts, et al. eds., 2021) [hereinafter Farah, *Foreword to EU AND CARICOM*].

the broader discussions related to the necessary changes and improvements of the international legal norms and systems of governance toward the protection of Non-Trade Concerns.¹⁰¹ At the core meaning of NTCs,¹⁰² there is the assertion that it is not really possible to have economic growth in the long term without a real geographical and geological balance between human activities and the Earth's habitat.¹⁰³ In general, we need to have an effective paradigm shift in the idea of industrialization and particularly in the development of cities. Any further expansion of the human race must happen with much more consideration given to the protection and respect of the flora and fauna. Otherwise, nature might continue to show us more and more visible negative effects on our society, with unpredictable spillover effects,¹⁰⁴ such as the impacts of COVID-19 on multinationalism. Security, trade, investment, economic growth, and environmental protection are so far separated components of national policy that should now be balanced and reconciled with a holistic and more naturally oriented vision.

Even before the pandemic, Paul Crutzen and Eugene Stoermer suggested that this environment is part of a new geological epoch: the Anthropocene.¹⁰⁵ This is the present era in which human activities are the main cause of environmental changes, at the territorial, structural, and climatic level. The imprint of humans and the weight of anthropogenic activities on the global ecosystem is increasingly marked. Of course, climate change is the most obvious and visible effect of this epoch. The effects that global warming produces on the ecosystem, such as the melting of glaciers, or extreme weather events such as tsunamis, hurricanes, and droughts, are dramatically increasing and becoming more the rule than the exception—more than isolated incidents.¹⁰⁶ Climate change affects not only the environment, but also the social dimension framed as the material living conditions of humans. For this reason, it is essential to assess the

¹⁰¹ See *supra* note 46 and accompanying text.

¹⁰² Mark Klaver & Michael Trebilcock, *Chinese Investment in Africa: Strengthening the Balance Sheet*, in CHINA'S INFLUENCE ON NON-TRADE CONCERNS IN INTERNATIONAL ECONOMIC LAW, *supra* note 46; Farah, *Foreward to EU AND CARICOM*, *supra* note 100; Imad Ibrahim et al., *The Principle of Common but Differentiated Responsibilities in the International Regime of Climate Change*, in CHINA'S INFLUENCE ON NON-TRADE CONCERNS IN INTERNATIONAL ECONOMIC LAW, *supra* note 46, at 146.

¹⁰³ See Heng Wang, *The Differences Between China's Recent FTA and the TPP: A Case Study of the China-Korea FTA*, in PARADIGM SHIFT IN INTERNATIONAL ECONOMIC LAW RULE-MAKING: TPP AS A NEW MODEL FOR TRADE AGREEMENTS 293 (2017); Farah, *supra* note 46.

¹⁰⁴ See generally DAVID QUAMMEN, SPILLOVER: ANIMAL INFECTIONS AND THE NEXT HUMAN PANDEMIC (2012).

¹⁰⁵ Paul J. Crutzen & Eugene F. Stoermer, *The Anthropocene*, in THE FUTURE OF NATURE 483 (Libby Robin et al. eds., 2013); Paul J. Crutzen, *Geology of Mankind*, 415 NATURE 23 (2002); PAUL J. CRUTZEN, *BENVENUTI NELL'ANTROPOCENE: L'UOMO HA CAMBIATO IL CLIMA, LA TERRA ENTRA IN UNA NUOVA ERA* [WELCOME TO THE ANTHROPOCENE: MAN HAS CHANGED THE CLIMATE, THE EARTH IS ENTERING A NEW ERA] (2005) (It.); ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5.

¹⁰⁶ See sources cited *supra* note 19.

relationships between science, technology, and society.¹⁰⁷ Important analyses have already been examined in order to understand at which point science and technology are helping humans and from which point they are harming nature (to include humans themselves and non-humans).¹⁰⁸

The Anthropocene¹⁰⁹ epoch differs from the Holocene based on a stratigraphic investigation at the level of the Earth's surface.¹¹⁰ The relationship between the Anthropocene and climate change is very close, considering that the Anthropocene is characterized precisely as an era in which there is a clear global climate change generated by a process that can be traced back to the advent of the steam engine, then passing through the dizzying late-modern industrial growth combined with increases in transportation, communications, the use of chemicals, and the general level of consumption.¹¹¹ The upsurge in carbon dioxide emission levels is nothing more than one of the most evident and relevant indicators of the technical-economic process of the second modernity capable of directly affecting global climatic conditions. Not surprisingly, the "Great Acceleration," which consolidates the period of the Anthropocene, is placed in the period between 1945 and today.¹¹²

¹⁰⁷ The interconnections between the three concepts are central in the interdisciplinary field of Science and Technology Studies (STS). For an overview of the main ideas of STS, see Jack Ingram et al., *Products and Practices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice*, 23 DESIGN ISSUES 3 (2007); Sergio Sismondo, *Science and Technology Studies*, in COMPANION TO ENVIRONMENTAL STUDIES 356 (Noel Castree et al. eds., 2018); Woolgar & Lezaun, *supra* note 83; THE HANDBOOK OF SCIENCE AND TECHNOLOGY STUDIES, *supra* note 83.

¹⁰⁸ In the 1971 landmark study "The Closing Circle," Barry Commoner disputed precisely this relation between human and non-humans. BARRY COMMONER, *THE CLOSING CIRCLE: NATURE, MAN, AND TECHNOLOGY* (1971).

¹⁰⁹ See generally ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5; Maurizio Marinelli, *How to Build a 'Beautiful China' in the Anthropocene. The Political Discourse and the Intellectual Debate on Ecological Civilization*, 23 J. CHINESE POL. SCI. 365 (2018); Haff, *supra* note 85; Valtonen & Rantala, *supra* note 84; Jacob Bendix & Michael A. Urban, *Nothing New Under the Sun? George Perkins Marsh and Roots of U.S. Physical Geography*, 111 ANNALS ASS'N AM. GEOGRAPHERS 709 (2021); Jean-Yves Heurtebise, *Philosophy of Energy and Energy Transition in the Age of the Petro-Anthropocene*, 13 J. WORLD ENERGY L. & BUS. 100 (2020); Paul Alberts, *Responsibility Towards Life in the Early Anthropocene*, 16 ANGELAKI 5 (2011); Paolo Davide Farah, *Strategies to Balance Energy Security, Business, Trade and Sustainable Development: Selected Case Studies*, 13 J. WORLD ENERGY L. & BUS. 95 (2020); Jean-Yves Heurtebise, *Sustainability and Ecological Civilization in the Age of Anthropocene: An Epistemological Analysis of the Psychosocial and "Culturalist" Interpretations of Global Environmental Risks*, 9 SUSTAINABILITY 1331 (2017); SUSTAINABILITY AND PEACEFUL COEXISTENCE FOR THE ANTHROPOCENE, *supra* note 94; Farah & Prityi, *supra* note 5; J. R. MCNEILL & PETER ENGELKE, *THE GREAT ACCELERATION: AN ENVIRONMENTAL HISTORY OF THE ANTHROPOCENE SINCE 1945* (2016); CHRISTOPHE BONNEUIL & JEAN-BAPTISTE FRESSOZ, *THE SHOCK OF THE ANTHROPOCENE: THE EARTH, HISTORY AND US* (David Fernbach trans., 2016); Will Steffen et al., *The Trajectory of the Anthropocene: The Great Acceleration*, 2 ANTHROPOCENE REV. 81 (2015); Olivier De Schutter et al., *Food as Commons: Towards a New Relationship Between the Public, the Civic and the Private*, in ROUTLEDGE HANDBOOK OF FOOD AS A COMMONS (Jose Luis Vivero-Pol et al. eds., 2019).

¹¹⁰ Colin N. Waters et al., *The Anthropocene is Functionally and Stratigraphically Distinct from the Holocene*, 351 SCIENCE 137 (2016).

¹¹¹ Steffen et al., *supra* note 109.

¹¹² MCNEILL & ENGELKE, *supra* note 109.

B. *From Ecological Modernization to Climate Justice*

Even though the concept of the Anthropocene epoch comes from natural sciences, the historical, political, cultural, and social connotations are of key importance. The “progressive” and expansive narrative of the Anthropocene questions, rooted in modernity, are continually reiterated in the context of economic globalization. At the same time, we can identify, through oversimplification, two general approaches that derive from the contemporary awareness of the conspicuously counterproductive character of human action with respect to the environment.

The first approach can be associated with the umbrella concept of ecological modernization¹¹³ or the neoliberal-promoted idea of sustainable development.¹¹⁴ This approach does not deny the techno-economic

¹¹³ In China, this concept has been reframed by highlighting the need to connect modernization with the populace. Sam Geall & Adrian Ely, *Narratives and Pathways Towards an Ecological Civilization in Contemporary China*, 236 CHINA Q. 1175 (2018). On ecological modernization, see JOSEPH HUBER, *NEW TECHNOLOGIES AND ENVIRONMENTAL INNOVATION* (2004); THE ECOLOGICAL MODERNISATION READER: ENVIRONMENTAL REFORM IN THEORY AND PRACTICE (Arthur P.J. Mol et al. eds., 2009). For a sectoral and emblematic reflection on the relationship between the model of sustainable development and the juridical-economic logic of the global scenario, see Paolo Davide Farah & Tivadar Ötvös, *Competition Law and Trade in Energy vs. Sustainable Development: A Clash of Individualism and Cooperative Partnerships?*, 2 ARIZ. ST. L.J. 497 (2018).

¹¹⁴ Green economy denotes such a development-oriented approach. See Morgera & Savaresi, *supra* note 82; Ömer Faruk Gültekin & Betül Erenoğlu, *A Research on Policies for Green Economy in Developed and Developing Countries Within the Scope of Sustainable Development*, 6 GLOB. ECON. OBSERVER, no. 1, 2018, at 33; RICARDO ABRAMOVAY, *BEYOND THE GREEN ECONOMY* (2016); Achim Steiner, Executive Director, U.N. Environment Programme [UNEP], *Focusing on the Good or the Bad: What Can International Environmental Law Do to Accelerate the Transition Towards a Green Economy?*, Grotius Lecture Ser. (Mar. 25, 2009), in 25 AM. U. INT’L L. REV. 843 (2010); Bosselmann et al., *supra* note 82; Gupta & Sanchez, *supra* note 82; GREEN GROWTH: MANAGING THE TRANSITION TO A SUSTAINABLE ECONOMY (Diego A. Vazquez-Brust & Joseph Sarkis eds., 2012); Imad Antoine Ibrahim & Davide Giacomo Zoppoloto, *Greening the Economy for the Sustainability Transition: An International Legal Perspective*, in THE PALGRAVE HANDBOOK OF CLIMATE RESILIENT SOCIETIES (Robert C. Brears ed., 2020); Jason Hickel & Giorgos Kallis, *Is Green Growth Possible?*, 25 NEW POL. ECON. 469 (2019); Markus W. Gehring, *Legal Transition to the Green Economy*, 12 MCGILL INT’L J. SUST. DEV. L. & POL’Y 135 (2016); Sue Farran, *Regulating the Environment for Blue-Green Economy in Plural Legal States: A View from the Pacific*, 50 J. LEGAL PLURALISM & UNOFFICIAL L. 119 (2018); SUSTAINABLE ECONOMIC DEVELOPMENT: GREEN ECONOMY AND GREEN GROWTH (Walter Leal Filho et al. eds., 2017); Kamal Hossain, *The Effectiveness of International Law in “Greening” the Economy: Challenges for the Developed and Developing World*, 108 AM. SOC’Y INT’L L. 407 (2015); Paloma Villanueva Cortés, *The External Impact of the Green Economy: An Analysis of the Environmental Implications of the Green Economy* (Berlin Sch. Econ. & L., Working Paper No. 56/2015, 2015), https://www.ipe-berlin.org/fileadmin/institut-ipe/Dokumente/Working_Papers/ipe_working_paper_56.pdf; Olivia Bina, *The Green Economy and Sustainable Development: An Uneasy Balance?*, 31 ENV’T & PLAN. C: GOV’T & POL’Y 1023 (2013); Joanna Cabello, *The Politics of the Clean Development Mechanism: Hiding Capitalism Under the Green Rug*, in UPSETTING THE OFFSET: THE POLITICAL ECONOMY OF CARBON MARKETS 192 (Steffan Böhm & Siddhartha Dabhi eds., 2009); Fabiano de Andrade Correa, *The Role of Law in the Green Economy: Challenges and Opportunities for the Liberalization of Environmental Goods and Services*, in 5 WORLD BANK LEGAL REV.: FOSTERING DEVELOPMENT THROUGH OPPORTUNITY, INCLUSION, AND EQUITY 147 (Hassane Cissé et al. eds., 2014); Sherzod Shadikhodjaev et al., *Green*

assumptions that generated the Anthropocene, but only tries to reduce environmental degradation via a wide array of market-based mechanisms or political commitments on the green transition. Under this approach, science and technology are seen as tools to design a production process able to progressively reduce the harmful effects of human activities on the environment. This is the dominant approach and could also be seen in international climate summits,¹¹⁵ which try to strike a balance between economic development and sustainable development and only recently acknowledged the need and the importance of intergenerational equity.¹¹⁶ Still, the international climate change negotiations have involved representation from civil society, including the business sector as well as multinational companies that committed to cut their emissions regardless of the eventual signature of the Paris Agreement.¹¹⁷ Ecological modernization

Growth and WTO Rules: Harmonization from Korea's Perspective, 3 KIEP WORLD ECON. BRIEF, no. 25, May 31, 2013.

¹¹⁵ International climate conferences, also referred as Conferences of the Parties (COP) (with parties understood as countries that have acceded to the UNFCCC) were launched for the first time in 1992 in Rio de Janeiro, Brazil. See G.A. Res. 44/228, at 152 (Dec. 22, 1989). In fact, the UNFCCC was held in Rio in that year, and the resulting document from this convention, informally called the Earth Summit, is known as the Rio Declaration. Rep. of the U.N. Conf. on Env't & Dev., U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I) (June 3–14, 1992) [hereinafter Rio Declaration]; see also *United Nations Conference on Environment and Development, Rio de Janeiro, Brazil*, UNITED NATIONS, <https://www.un.org/en/conferences/environment/rio1992> (last visited Apr. 22, 2023). This convention gave birth to the first international environmental treaty. The treaty was aimed at reducing greenhouse gas emissions based on the hypothesis of global warming but did not set mandatory limits for individual nations. The treaty was therefore legally nonbinding. Yet, the established framework included the possibility for the signatory parties to adopt, at special conferences, additional acts (called "Protocols") which could set mandatory emission limits. The most important of such Protocols, adopted in 1997 and entered into force in 2005, is the Kyoto Protocol. Kyoto Protocol to the United Nations Framework Convention on Climate Change, annex A, Dec. 11, 1997, 2303 U.N.T.S. 162. During the COP 2007 in Bali, Indonesia, and the COP 2009 in Copenhagen, Denmark, however, no concrete results were obtained. To solve this impasse, the following two COPs placed emphasis on boosting dialogues between interested parties and established the Green Climate Fund. The fund was aimed at supporting developing countries in their efforts to reduce environmental degradation in their medium plan. See *Bali Road Map Intro*, U.N. CLIMATE CHANGE, <https://unfccc.int/process/conferences/the-big-picture/milestones/bali-road-map> (last visited Apr. 27, 2023); Rep. of the Conf. of the Parties to the U.N. Framework Convention on Climate Change, U.N. Doc FCCC/CP/2010/7 (Nov.–Dec. 2010). A key milestone for international environmental law was reached during the 2015 Paris Climate Conference with the Paris Agreement. Within the Paris Agreement, 196 countries committed to limit the increase in the global average temperature well below 2 degrees Celsius. The Paris Agreement officially entered into force on November 4, 2016. Paris Agreement, *supra* note 12. In contrast, the last four UNFCCC COPs did not obtain the expected results, and in 2020 the COP to be held in Glasgow, Scotland, was postponed because of COVID-19 and was held later in 2021. See *Road to Glasgow*, U.N. CLIMATE CHANGE, <https://unfccc.int/road-to-glasgow> (last visited Apr. 27, 2023).

¹¹⁶ Edith Brown Weiss, *Intergenerational Equity in a Kaleidoscopic World*, 49 ENV'T POL'Y & L. 4 (2019).

¹¹⁷ See Hakan Seckinelgin, *A Global Disease and Its Governance: HIV/AIDS in Sub-Saharan Africa and the Agency of NGOs*, 11 GLOB. GOVERNANCE 351 (2005); Guobin Yang, *Environmental NGOs and Institutional Dynamics in China*, 181 CHINA Q. 46 (2005); Helmut Breitmeier & Volker Rittberger, Eberhard-Karls-Univ., *Environmental NGOs in an Emerging Global Civil Society*, U.N.

remains anchored, despite several attempts to reverse the trend, to the foundations of techno-economic capitalism, and this could be one of the reasons for its failure as an effective strategy at a domestic and global level. In fact, such an approach does not involve a radical rethinking of lifestyles, production models, or criteria for the distribution of wealth,¹¹⁸ which is becoming more and more necessary to try to reverse the irreparable damage that has already been caused to the Earth. Ultimately, when confronted with budget constraints and possible civil unrest or protests, policy makers might continue to shape their policies by giving higher priority to the economic consequences of their decisions, such as job losses or financial disruption, instead of the environmental consequences. For this reason, it is essential that both leaders and the common people understand the long-term economic and social consequences of putting the environment as the top priority for any governmental or political agenda.

The second, alternative, approach is one of climate justice and intergenerational equity.¹¹⁹ It is a polysemic concept, able to evoke two different ideas. First, in a narrow sense, legal remedies, under the logic of multilevel systems,¹²⁰ could be proposed on the basis of the damage to individuals or communities due to climate change. This is clearly represented by the growing amount of climate change litigation occurring

University Symposium: The United Nations and the Global Environment in the 21st Century: From Common Challenges to Shared Responsibilities, Nov. 14–15, 1997, <https://archive.unu.edu/ona/PDF/Papers/Rittberger,%20V%20PAPER.pdf>; L. David Brown et al., *Globalization, NGOs and Multisectoral Relations*, in GOVERNANCE IN A GLOBALIZING WORLD (Joseph S. Nye & John D. Donahue eds., 2000); ERIN HANNAH, NGOS AND GLOBAL TRADE: NON-STATE VOICES IN EU TRADE POLICYMAKING (2016); Peter van Tuijl, *NGOs and Human Rights: Sources of Justice and Democracy*, 52 J. INT'L AFFS. 493 (1999); JoAnn Fagot Aviel, *The Evolution of Multilateral Diplomacy*, in MULTILATERAL DIPLOMACY AND THE UNITED NATIONS TODAY (James P. Muldoon Jr. et al. eds., 2d ed. 2005); Steve Charnovitz, *Two Centuries of Participation: NGOs and International Governance*, 18 MICH. J. INT'L L. 183 (1997); C.P. Pow, *Building a Harmonious Society Through Greening: Ecological Civilization and Aesthetic Governmentality in China*, 108 ANNALS ASS'N AM. GEOGRAPHERS 864 (2018); Christian Reus-Smit, *Changing Patterns of Governance: From Absolutism to Global Multilateralism*, in BETWEEN SOVEREIGNTY AND GLOBAL GOVERNANCE 3 (Albert J. Paolini et al. eds., 1998); Oliver P. Richmond, *Critical Agency, Resistance and a Post-Colonial Civil Society*, 46 COOP. & CONFLICT 419 (2011); Sara A. Newland, *Innovators and Implementers: The Multilevel Politics of Civil Society Governance in Rural China*, 233 CHINA Q. 22 (2018); Benjamin Zawacki, *Of Questionable Connectivity: China's BRI and Thai Civil Society*, COUNCIL FOREIGN RELS. (June 7, 2021, 4:14 PM), <https://www.cfr.org/blog/questionable-connectivity-chinas-bri-and-thai-civil-society>; CHRISTOPHER L. PALLAS, TRANSNATIONAL CIVIL SOCIETY AND THE WORLD BANK: INVESTIGATING CIVIL SOCIETY'S POTENTIAL TO DEMOCRATIZE GLOBAL GOVERNANCE (2013).

¹¹⁸ For an overview of the alternatives to the current global governance system see the work of Margaret Stout and Jeannine M. Love, cited *supra* note 36.

¹¹⁹ MARY ROBINSON WITH CAITRÍONA PALMER, CLIMATE JUSTICE: HOPE, RESILIENCE, AND THE FIGHT FOR A SUSTAINABLE FUTURE (2018); HENRY SHUE, CLIMATE JUSTICE: VULNERABILITY AND PROTECTION (2014); James Goodman, *From Global Justice to Climate Justice? Justice Ecologism in an Era of Global Warming*, 31 NEW POL. SCI. 499 (2009); Tim Hayward, *Human Rights Versus Emissions Rights: Climate Justice and the Equitable Distribution of Ecological Space*, 21 ETHICS INT'L AFFS. 431 (2007); VANDANA SHIVA, EARTH DEMOCRACY: JUSTICE, SUSTAINABILITY, AND PEACE (2005).

¹²⁰ Farah & Rossi, *supra* note 23.

around the world.¹²¹ The second idea, attached to climate justice, which covers its theoretical underpinning in a much broader sense, is a conceptual strategy rooted in political activism, social movements, and world civic politics¹²² with respect to climate change and environmental protection, but without immediate recourse to legal instruments of enforcement and implementation.¹²³ It seems that this second meaning is the more commonly attributed to climate justice because of the rise of political ecology¹²⁴ as a hotly debated and researched field with an evident connection between the theories and the practice actioned particularly by environmental nongovernmental organizations¹²⁵ (NGOs) and civil society groups. The expression “climate justice” identifies global warming as the cause of an ethical and political concern. Against this background, the term “justice” is not directly related to the satisfaction of legal claims in a technical sense, but rather involves an ethical reflection that includes the link between human rights, collective rights, and the historical contribution and responsibilities of political and economic subjects with regard to climate change. At the heart of this approach is the critique of the greater damage suffered by vulnerable populations and communities, particularly those in the Global South, as a result of climate change due to the industrialization, economic

¹²¹ K.J. de Graaf & J. H. Jans, *The Urgenda Decision: Netherlands Liable for Role in Causing Dangerous Global Climate Change*, 27 J. ENV'T L. 517 (2015); Renee N. Salas et al., *The Case of Juliana v. U.S.—Children and the Health Burdens of Climate Change*, 380 NEW ENG. J. MED. 2085 (2019); Paolo Davide Farah & Imad Antoine Ibrahim, *Urgenda vs. Juliana: Lessons for Future Climate Change Litigation Cases*, 84 U. PITT. L. REV. 3 (2022).

More recently, a judgment of the Hague District Court highlighted a key breakthrough in climate change litigations. See Steef M. Bartman & Cornelis De Groot, *The Shell Nigeria Judgments by the Court of Appeal of the Hague, a Breakthrough in the Field of International Environmental Damage? UK Law and Dutch Law on Parental Liability Compared*, 18 EUR. CO. L. 97 (2021).

¹²² Homer-Dixon recognized already in 1991 the potential key role of the environmental crisis in pushing massive social uprising and protests. Thomas F. Homer-Dixon, *On the Threshold: Environmental Changes as Causes of Acute Conflict*, 16 INT'L SEC. 76 (1991). The environmental degradation that took place in China following massive industrialization resulted in a wave of environmental protests. H. Christoph Steinhardt & Fengshi Wu, *In the Name of the Public: Environmental Protest and the Changing Landscape of Popular Contention in China*, 75 CHINA J. 61 (2015). On the significance of civil society participation in social movements, see Helen M. Poulos, *How Do Grassroots Environmental Protests Incite Innovation?*, in NIMBY IS BEAUTIFUL: CASES OF LOCAL ACTIVISM AND ENVIRONMENTAL INNOVATION AROUND THE WORLD 15 (Carol Hager & Mary Alice Haddad eds., 2015). In the United States, environmental protests against the Dakota pipeline connected different civic movements. See Omer Aijazi & Martin David, *A New Clayoquot? Examining the Convergence of First Nations and Environmental NGOs in Vancouver's Anti-Pipeline Protests*, in 3 CLIMATE AND CULTURE, CULTURAL DYNAMICS OF CLIMATE CHANGE AND THE ENVIRONMENT IN NORTHERN AMERICA 257 (Bernd Sommer ed., 2015); Kyle Powys Whyte, *The Dakota Access Pipeline, Environmental Injustice, and U.S. Settler Colonialism*, 19 RED INK 154 (2017).

¹²³ See NEIL CARTER, *THE POLITICS OF THE ENVIRONMENT: IDEAS, ACTIVISM, POLICY* (3d ed. 2018).

¹²⁴ THE ROUTLEDGE HANDBOOK OF POLITICAL ECOLOGY, *supra* note 93.

¹²⁵ For a general overview of the role of NGOs engagement with international organizations and global governance institutions, see Brown et al., *supra* note 117; Charnovitz, *supra* note 117. For analyses on NGO participation in international policy making, see Seckinelgin, *supra* note 117 (health); Breitmeier & Rittberger, *supra* note 117 (environment); HANNAH, *supra* note 117 (trade); Aviel, *supra* note 117 (international affairs); van Tuijl, *supra* note 117 (human rights).

development, growth, and wealth created in the Global North.¹²⁶ Particular attention is therefore paid to the different historical contributors to global pollution and climate change.¹²⁷ It requires a balanced approach that encompasses both those most affected by climate change and those who are more generally affected by the conditions that generate such changes and that involve lifestyles capable of producing high emissions and poor efficiency in the use of environmental resources.¹²⁸ In this sense, climate justice aims to protect the most vulnerable as they lack the adequate resources for dealing with the environmental and socio-economic effects of climate change. The most vulnerable in highly developed and industrialized societies (such as children, women, and migrants) often coincide and share similar needs with the same populations of the less developed and poorer regions around the globe.

Climate justice,¹²⁹ intended here as ethical-political justice, has been elaborated and proposed chiefly by the most committed NGOs working on environmental issues.¹³⁰ The phrase “climate justice” only recently entered, with resistance, the lexicon used by the international economic institutions, the United Nations, and the international climate negotiations. The 2016 Paris Agreement marks a partial turning point with respect to the prevalence of the ecological approach to modernization. The Agreement emphasizes the concept of climate justice and its importance in the actions to be carried out to reach a just and equitable green transition.¹³¹ At a regional level, for example, the European Union Parliament resolution of January 16, 2018, on women, equal opportunities, and climate justice—often the most affected categories—includes reference to the concept of climate justice.¹³² The resolution argues that the EU, in line with its capabilities, can contribute to

¹²⁶ See HANNAH, *supra* note 117; van Tuijl, *supra* note 117.

¹²⁷ See Charnovitz, *supra* note 117; van Tuijl, *supra* note 117.

¹²⁸ FACING GLOBAL ENVIRONMENTAL CHANGE: ENVIRONMENTAL, HUMAN, ENERGY, FOOD, HEALTH AND WATER SECURITY CONCEPTS (Hans Günter Brauch et al. eds., 2009); Christian Schubert, *Green Nudges: Do They Work? Are They Ethical?*, 132 *ECOLOGICAL ECON.* 329 (2017).

¹²⁹ See Matthew Rimmer, *Beyond the Paris Agreement: Intellectual Property, Innovation Policy, and Climate Justice*, 8 *LAWS* 7 (2019); David Schlosberg & Lisette B. Collins, *From Environmental to Climate Justice: Climate Change and the Discourse of Environmental Justice*, 5 *WIRES CLIMATE CHANGE* 359 (2014); Parks & Roberts, *supra* note 20; JULIA PUASCHUNDER, *Mapping Climate Justice*, in *GOVERNANCE & CLIMATE JUSTICE: GLOBAL SOUTH & DEVELOPING NATIONS* 23 (2020); *Opinion of the European Economic and Social Committee on “Climate Justice,”* 2018 O.J. (C 81) 4; Resolution 2017/2086(INI), of the European Parliament of 16 January 2018 on Women, Gender Equality and Climate Justice, 2018 O.J. (C 458) 3.

¹³⁰ For further discussion of the contribution of NGOs to international climate change negotiations, see generally Katharina Rietig, *The Power of Strategy: Environmental NGO Influence in International Climate Negotiations*, 22 *GLOB. GOVERNANCE* 269 (2016). For a specific analysis of Greenpeace, see Edwin R. Stafford et al., *Environmental NGO–Business Collaboration and Strategic Bridging: A Case Analysis of the Greenpeace–Foron Alliance*, 9 *BUS. STRATEGY & ENV’T* 122 (2000).

¹³¹ The preamble of the Paris Agreement posits the importance of the concept of “climate justice” when taking action to address climate change. Paris Agreement, *supra* note 12.

¹³² 2018 O.J. (C 458) 3.

improving legal and political structures in support of climate justice by promoting the construction of an international framework aimed at “adopt[ing] a gender-responsive, human-rights-based approach . . . to avert, minimise and address displacement related to the adverse impacts of climate change, which acknowledges that women and girls belong to the most vulnerable groups displaced by climate change and are therefore particularly vulnerable to trafficking and gender-based violence.”¹³³

Through the concept of climate justice reconstructed here, the emphasis is placed on the social and spatial inequalities that the technical-economic evolution has entailed, as well as on the unequal distribution of the costs of this approach. The concept is supported at the theoretical level by the literature on environmental history¹³⁴ and political ecology,¹³⁵ in which the origins and developments of the ecological crisis have been reconstructed for decades. These factors enabling the crisis should be analyzed at both the material level (as in the case of terrestrial environmental degradation), and the theoretical or symbolic level (as in the case of the perception of the world itself and in the conceptions of individual and collective life that have established themselves over time). Not surprisingly, environmental history highlights the relationship between Western civilization processes and the progressive degradation of the biosphere.¹³⁶ In addition, political ecology acknowledges the relationship between colonial power and environmental degradation.¹³⁷ For all these reasons, climate justice in its more political connotation leads to a radical rethinking of the trajectories of the Western process of civilization.¹³⁸ Other countries’ experiences, if historically grounded, could also help in further strengthening environmental protection at the global level.¹³⁹ Pursuing the ideal of climate justice implies the need to question not only individual and collective lifestyles¹⁴⁰ but also the very structure of production processes.

¹³³ *Id.* ¶ 16; *see also id.* ¶ 29 (“calls for the EU and its Member States to develop the principle of climate justice; insists that the greatest injustice of our failure to tackle climate change effectively would be the detrimental effects on poor countries and populations, and on women in particular”); Resolution 2019/2582(RSP), of the European Parliament of 14 March 2019, on Climate Change: a European Strategic Long-Term Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy in Accordance with the Paris Agreement. 2021 O.J. (C 23) 20.

¹³⁴ *SITUATING ENVIRONMENTAL HISTORY* (Ranjan Chakrabarti ed., 2007); J. DONALD HUGHES, *WHAT IS ENVIRONMENTAL HISTORY?* (2d ed. 2016); GILBERT F. LAFRENIERE, *THE DECLINE OF NATURE: ENVIRONMENTAL HISTORY AND THE WESTERN WORLDVIEW* (2008).

¹³⁵ *See THE ROUTLEDGE HANDBOOK OF POLITICAL ECOLOGY*, *supra* note 93.

¹³⁶ Jason W. Moore, *Marx’s Ecology and the Environmental History of World Capitalism*, 12 *CAPITALISM NATURE SOCIALISM* 134, 136 (“Every phase of capitalist development entails a new, more expansive and more intensive, exploitative relation to the land.”).

¹³⁷ Forsyth, *supra* note 93, at 759.

¹³⁸ *STOUT & LOVE, DYSTOPIAN UTOPIAS*, *supra* note 36.

¹³⁹ Farah, *supra* note 109, at 98.

¹⁴⁰ For a critical analysis of the Degrowth movement, see Giorgos Kallis et al., *Research on Degrowth*, 43 *ANN. REV. ENV’T & RES.* 291 (2018).

The most disruptive long-term effect of climate justice is the awareness of the inadequacy not only of our lifestyles but also of the institutions used to deal with climate change. It is an approach that leads us to understand how a global policy is urgently needed. This leads, again, to the discovery of how political categories still have a meaning today in order to overcome the friend/enemy distinction. In the Anthropocene epoch, there needs to be an understanding of how politics must increasingly come to terms with the following fundamental oppositions: the conflicts among humans, and the conflicts between humans and non-humans. Further, it is necessary to have a genuine and honest consideration of the negative effects that human activities cause, including a deliberately manipulated and endangered environment that puts the very essence of the Earth and the lives of both humans and non-humans at stake.

Ecological crises also show a peculiar feature of social systems and organization in the age of globalization. Against the background of a structurally complex real world, social systems are faced with an environment (not in the biophysical sense but in the social and cultural one) in which the number of particular situations, provided by concrete and feasible possibilities, has increased exponentially because of the acceleration of technological and economic advancements.¹⁴¹ The selection of the possibilities offered by the environment, aimed at reducing the gap between the multiplicity of possible and feasible experiences and aimed at reducing social complexity, is, consequently, increasingly unmanageable.¹⁴²

¹⁴¹ Opratko et al., *supra* note 53; Larionova & Kirton, *supra* note 48; ARMIN VON BOGDANDY & PEDRO VILLARREAL, MAX PLANCK INST. FOR COMPAR. PUB. L. & INT'L L., MPIL RSCH. PAPER SER. NO. 2020-07, INTERNATIONAL LAW ON PANDEMIC RESPONSE: A FIRST STOCKTAKING IN LIGHT OF THE CORONAVIRUS CRISIS (2020); Gunnar Beck, *Legitimation Crisis, Reifying Human Rights and the Norm-Creating Power of the Factual: Reply to "Reifying Law: Let Them Be Lions,"* 26 PENN ST. INT'L L. REV. 565 (2008); Brunnée, *supra* note 35; Ben Crum, *Parliamentary Accountability in Multilevel Governance: What Role for Parliaments in Post-Crisis EU Economic Governance?*, 25 J. EUR. PUB. POL'Y 268 (2018); Anne Van Aaken & Jürgen Kurtz, *Prudence or Discrimination? Emergency Measures, the Global Financial Crisis and International Economic Law*, 12 J. INT'L ECON. L. 859 (2009); Stephen Gill, *Structural Changes in Multilateralism: The G-7 Nexus and the Global Crisis*, in INNOVATION IN MULTILATERALISM (Michael G. Schechter ed., 1999); THE CRISIS OF MULTILATERAL LEGAL ORDER: CAUSES, DYNAMICS AND IMPLICATIONS (Lukasz Gruszczynski et al. eds., 2023); Mike Smith, *The EU, the US and the Crisis of Contemporary Multilateralism*, 40 J. EUR. INTEGRATION 539 (2018); Elizabeth C. Economy, *The Great Leap Backward? The Costs of China's Environmental Crisis*, FOREIGN AFFS. SEPT./OCT. 2007, at 38; Paul J.J. Welfens, *Trump's Trade Policy, BREXIT, Corona Dynamics, EU Crisis and Declining Multilateralism*, 17 INT'L ECON. & ECON. POL'Y 563 (2020); Matt Huber, *Resource Geographies I: Valuing Nature (or Not)*, 42 PROGRESS HUM. GEOGRAPHY 148 (2018); THE POWER OF PRAGMATISM: KNOWLEDGE PRODUCTION AND SOCIAL INQUIRY (Jane Wills & Robert W. Lake eds., 2020); Matthew C. Nisbet & Dietram A. Scheufele, *What's Next for Science Communication? Promising Directions and Lingering Distractions*, 96 AM. J. BOTANY 1767 (2009).

¹⁴² Scenario planning in the environmental context is important to envision different futures. See ERIKA L. ROWLAND ET AL., U.S. FISH & WILDLIFE SERV., CONSIDERING MULTIPLE FUTURES: SCENARIO PLANNING TO ADDRESS UNCERTAINTY IN NATURAL RESOURCE CONSERVATION (2014), [https://www.cakex.org/sites/default/files/documents/Final%20Scenario%20Planning%20Document\(2\).pdf](https://www.cakex.org/sites/default/files/documents/Final%20Scenario%20Planning%20Document(2).pdf);

As Niklas Luhmann has masterfully explained, the reduction of this complexity is the operation that constitutes, and in some way justifies, the systems and in particular the social subsystems (law, politics, economics, science, morals, etc.)¹⁴³ as specific tools aimed at reducing the distance that exists between expectations and concretely experientable possible futures.¹⁴⁴ The global environment is a complex context and requires categories that are not so easy to combine with the needs of social systems, which are, most of the time, evidently a representation of needs and instances developed at the local level. In fact, social systems struggle to delimit their own scope with respect to the global environment. In this context, it is necessary to continue to proactively face challenges to bring unity to the dichotomy between global and local through the concept of “glocal” and “glocalism.”¹⁴⁵ A subsystem—such as the political one tasked via the exercise of the power of political forces and public administration¹⁴⁶—to govern complexity ends up submitting more and more to other subsystems (although this does not correspond to a Luhmannian theoretical representation), whose communication codes respond to logics inevitably different from the political ones. The concept of a “global village” can help us understand how science and technology have modified how humans perceive time and space: “‘Time’ has ceased, ‘space’ has vanished.”¹⁴⁷ But nature and non-humans do not follow our rules, and their needs might remain immutable for centuries. Global environmental movements, helped in their concerted

Richard P. Hiskes, *The Right to a Green Future: Human Rights, Environmentalism, and Intergenerational Justice*, 27 HUM. RTS. Q. 1346 (2005); VICTORIA KAHN, *THE FUTURE OF ILLUSION: POLITICAL THEOLOGY AND EARLY MODERN TEXTS* (2014); Fuwen Wei et al., *Ecological Civilization: China’s Effort to Build a Shared Future for All Life on Earth*, NAT’L SCI. REV., July 2021, art. nwab112; Bodansky, *supra* note 17; Francesco Gardumi et al., *A Scenario Analysis of Potential Long-Term Impacts of COVID-19 on the Tunisian Electricity Sector*, ENERGY STRATEGY REVS., Nov. 2021, art. 100759; Jonathan Star et al., *Supporting Adaptation Decisions Through Scenario Planning: Enabling the Effective Use of Multiple Methods*, 13 CLIMATE RISK MGMT. 88 (2016).

¹⁴³ Regarding the legal social subsystem and the concept of juridical order as a product of social context, see SANTI ROMANO, *THE LEGAL ORDER* (Mariano Croce ed. & trans., 2017); Paolo Davide Farah, *L’influenza della concezione confuciana sulla costruzione del sistema giuridico e politico cinese [The Influence of Confucianism on the Construction of the Chinese Political and Juridical System]*, in IDENTITÀ EUROPEA E POLITICHE MIGRATORIE 193 (Giovanni Bombelli & Bruno Montanari eds., 2008) (It.).

¹⁴⁴ NIKLAS LUHMANN, *SOCIAL SYSTEMS* (John Bednarz Jr. with Dirk Baecker trans., Stan. Univ. Press 1995) (1984).

¹⁴⁵ Joyeeta Gupta et al., *Climate Change: A “Glocal” Problem Requiring “Glocal” Action*, 4 ENV’T SCIS. 139 (2007); Erik Swyngedouw & Maria Kaika, *The Making of “Glocal” Urban Modernities*, 7 CITY 5 (2003).

¹⁴⁶ NIKLAS LUHMANN, *POLITISCHE PLANUNG: AUFSÄTZE ZUR SOZIOLOGIE VON POLITIK UND VERWALTUNG [POLITICAL PLANNING: ESSAYS ON THE SOCIOLOGY OF POLITICS AND ADMINISTRATION]* (1971) (Ger.); NIKLAS LUHMANN, *TRUST AND POWER* (Christian Morgner & Michael King eds. & trans., Polity Press 2017) (1973).

¹⁴⁷ MARSHALL McLUHAN & QUENTIN FIORE, *THE MEDIUM IS THE MESSAGE: AN INVENTORY OF EFFECTS* 63 (1967). McLuhan coined the phrase “global village” in his book *THE GUTENBERG GALAXY* (1962), and he developed the concept in more detail in MARSHALL McLUHAN & BRUCE R. POWERS, *THE GLOBAL VILLAGE: TRANSFORMATIONS IN WORLD LIFE AND MEDIA IN THE 21ST CENTURY* (1992).

actions by social media and technology, are able to transform this concept of a “global village” toward a more understandable concept of a community of shared (environmental) values, toward a healthy environment for our children and future generations. This activism also has important implications in terms of environmental awareness at the local, national, and international political levels. Leaders are becoming more and more accountable for the choices on policies that have implications or ramifications in the environmental sphere.¹⁴⁸ Public opinion now requires, more than ever, that their leader’s decisions are based in sound science and are not simply economically driven.

Precisely for these reasons, climate justice can be the vehicle of a political metamorphosis generated by climate change, but only if it is supported by a rationally acceptable ethical foundation.¹⁴⁹ Such a foundation must be able to oppose, at least at the theoretical level, the prevalence of the codes of the economic subsystem over the political one. Without a solid foundation, climate justice risks being confused with a mere, albeit legitimate, anticapitalist stance and therefore also risks being reduced to a mere ideological option. Such a theoretical framework should precisely identify future generations as actual victims of the damages caused by the environmental crisis. This would, at the very least, support the conceptual core of the demands advanced in the name of climate justice through an ethically based political approach that places three ideas at the center of the paradigm: we are all human beings, we are all brought together by the care and consideration for our children’s and grandchildren’s future and wellbeing, and we only have one Earth to preserve in a healthy environment. The next section, drawing on Hans Jonas’s *Ethics of Responsibility*, analyzes possible ways to move forward in the environmental crisis.

C. *The Need for a Trans-Temporal Ethics*

If the concept of climate justice seeks to chiefly address the protection of vulnerable people, future generations should represent an inescapable point of reference for any environmental strategy or policy.¹⁵⁰ It is precisely

¹⁴⁸ See, e.g., *Climate Protest Tracker*, CARNEGIE ENDOWMENT FOR INT’L PEACE, <https://carnegieendowment.org/publications/interactive/climate-protest-tracker> (last visited Apr. 22, 2023).

¹⁴⁹ See generally ENGAGING CONTRADICTIONS: THEORY, POLITICS, AND METHODS OF ACTIVIST SCHOLARSHIP (Charles R. Hale ed., 2008).

¹⁵⁰ For in-depth analyses of the philosophical implications of an ethics of responsibility aimed at protecting future generations and the environment, see INSTITUTIONS FOR FUTURE GENERATIONS (Iñigo González-Ricoy & Axel Gosseries eds., 2016); STEPHEN M. GARDINER, A PERFECT MORAL STORM: THE ETHICAL TRAGEDY OF CLIMATE CHANGE (2011); Matthias Fritsch & Ferdinando G. Menga, *Phenomenology and Responsibility Towards Future Generations*, 5 METODO INT’L STUD. PHENOMENOLOGY & PHIL. 7 (2017); FERDINANDO G. MENGA, L’EMERGENZA DEL FUTURO: I DESTINI DEL PIANETA E LE RESPONSABILITÀ DEL PRESENTE [THE EMERGENCY OF THE FUTURE: THE DESTINIES OF THE PLANET AND THE RESPONSIBILITIES OF THE PRESENT] (2021) (It.); FERDINANDO G. MENGA,

because future generations have no voice or safety net that they are passive subjects with respect to the effects of choices made by others, and thus they embody the very category of vulnerability.¹⁵¹ It is no coincidence that one of the most solid elaborations of environmental ethics,¹⁵² proposed by Hans Jonas, features reference to future generations in a leading role.¹⁵³

On a closer look, interests of future generations¹⁵⁴ in environmental matters, which could be translated into positive or negative rights with duties and obligations attached, acquire a complete, philosophical, and juridical meaning. Yet, these rights should be intended as reflections of human duties, and above all those duties that are addressed via public and collective policies are able to guarantee these rights even if they are not yet in existence. This peculiar relationship between rights and duties rests, as in Jonas's work, on a critical reading of modern technology and of how advancements in this field have a role in the social reality.¹⁵⁵ The benefits of technology should be placed on a parallel track that reflects on the threats they contain for the survival of humans and non-humans. Technological processes and advancements, especially emerging technologies such as artificial intelligence, blockchain, and big data, cannot be easily compared to those of previous geological epochs. Indeed, the Anthropocene epoch teaches us that “[m]odern technology, informed by an ever-deeper penetration of nature and propelled by the forces of market and politics, has enhanced human power beyond anything known or even dreamed of before.

ETICA INTERGENERAZIONALE [INTERGENERATIONAL ETHICS] (2021) (It.); FABIO CIARAMELLI & FERDINANDO G. MENGA, RESPONSABILITÀ VERSO LE GENERAZIONI FUTURE: UNA SFIDA AL DIRITTO ALL'ETICA E ALLA POLITICA [RESPONSIBILITY TO FUTURE GENERATIONS: A CHALLENGE TO THE RIGHT TO ETHICS AND POLITICS] (2017) (It.).

¹⁵¹ For a philosophical-juridical reflection on the category of vulnerability, see, for example, GIANFRANCESCO ZANETTI, FILOSOFIA DELLA VULNERABILITÀ: PERCEZIONE, DISCRIMINAZIONE, DIRITTO [PHILOSOPHY OF VULNERABILITY: PERCEPTION, DISCRIMINATION, LAW] (2019); VULNERABILITÀ: ANALISI MULTIDISCIPLINARE DI UN CONCETTO [VULNERABILITY: MULTIDISCIPLINARY ANALYSIS OF A CONCEPT] (Orsetta Giolo & Baldassare Pastore eds., 2018) (It.).

¹⁵² For a valuable reconstruction of the different approaches in this context, see CLIMATE ETHICS: ESSENTIAL READINGS (Stephen M. Gardiner et al. eds., 2010).

¹⁵³ On the scholarship of Hans Jonas on environmental ethics, see THERESA MORRIS, HANS JONAS'S ETHIC OF RESPONSIBILITY: FROM ONTOLOGY TO ECOLOGY (2013); LEWIS COYNE, HANS JONAS: LIFE, TECHNOLOGY AND THE HORIZONS OF RESPONSIBILITY (2020); VITTORIO HÖSLE, FILOSOFIA DELLA CRISI ECOLOGICA [PHILOSOPHY OF THE ECOLOGICAL CRISIS] (Paolo Scibelli trans., 1992) (1991) (It.); MARIA LOREDANA FURIOSI, UOMO E NATURA NEL PENSIERO DI HANS JONAS [MAN AND NATURE IN THE THOUGHT OF HANS JONAS] (2003) (It.); KARL-OTTO APEL ET AL., HANS JONAS: IL FILOSOFO E LA RESPONSABILITÀ [HANS JONAS: THE PHILOSOPHER AND RESPONSIBILITY] (2004) (It.); PAOLO BECCHI, LA VULNERABILITÀ DELLA VITA: CONTRIBUTI SU HANS JONAS [THE VULNERABILITY OF LIFE: CONTRIBUTIONS ON HANS JONAS] (2008) (It.).

¹⁵⁴ Stephen T. Garnett et al., *A Spatial Overview of the Global Importance of Indigenous Lands for Conservation*, 1 NATURE SUSTAINABILITY 369 (2018); De Schutter et al., *supra* note 109; Julie Davis, *Creating Change for People and Planet: Education for Sustainability Approaches and Strategies*, in 5 ENCYCLOPEDIA OF THE WORLD'S BIOMES 438 (Courtney E. Quinn ed., 2020); *Defining Global Public Goods*, in GLOBAL PUBLIC GOODS: INTERNATIONAL COOPERATION IN THE 21ST CENTURY 2 (Inge Kaul et al. eds., 1999); Weiss, *supra* note 116.

¹⁵⁵ See, e.g., JONAS, *supra* note 1.

It is a power over matter, over life on earth, and over man himself.”¹⁵⁶ The radically new character of emerging technologies that shape humans as technological bioproducts, such as genetically engineered humans,¹⁵⁷ makes both classical and modern ethics partially inadequate. The analysis of the rationality-based foundation of moral behavior clashes with the focus on future generations. In order to adapt ethics to the problems posed by technological advancements, it is necessary to change the perspective, especially with regard to time. The frame of reference cannot be the present but, necessarily, should be projected toward the future. This projection in the world to come should be rooted in both the present and the past with a genuine and informed memory of the mistakes and challenges that humans have faced when their actions were not carefully considering the hope for eternity of human beings and the infinity of nature, the Earth, and the cosmos. Humans should make decisions after careful reflection beyond the limits of time and space of their own physical existence and with contemplation of the invisible beyond the visible.

Such a perspective opens through what Jonas defines as “heuristics of fear,” which “must tell us what is *possibly* at stake and what we must beware of. The magnitude of those stakes, taken together with the insufficiency of our predictive knowledge, leads to the pragmatic rule to give the prophecy of doom priority over the prophecy of bliss.”¹⁵⁸ Jonas’s vision on duties and obligations and the consequent ethics of responsibility implies and requires an ethical reflection to make the best decisions now in light of a sustainable and positive future or futures.¹⁵⁹ On the other hand, without an ethical conscience, the discourse on the rights of future generations¹⁶⁰—and we would also argue the same as it pertains to climate justice—risks being reduced to a pure rhetorical exercise because it lacks adequate anthropological support. As can be seen from Jonas’s reflections and from the techno-economic reading of the Anthropocene, the contemporary context is unlike the past, not only of the pre-modern era but also of the first centuries of modernity. In fact, the potential of contemporary technology, which can produce irreversible effects in the short, medium, long and very long term, calls into question the very existence of humanity as a species and the image of man himself as being endowed with freedom and autonomy.

¹⁵⁶ *Id.* at ix.

¹⁵⁷ See generally R. Alta Charo, *Germline Engineering and Human Rights*, 112 *AJIL UNBOUND* 344 (2018); Grant Wilson, *Minimizing Global Catastrophic and Existential Risks from Emerging Technologies through International Law*, 31 *VA. ENV’T L.J.* 307 (2013); Anna Zaret, Note, *Editing Embryos: Considering Restrictions on Genetically Engineering Humans*, 67 *HASTINGS L.J.* 1805 (2016).

¹⁵⁸ JONAS, *supra* note 1, at x.

¹⁵⁹ ROWLAND ET AL., *supra* note 142; Star et al., *supra* note 142.

¹⁶⁰ For an overview of the relation between Jonas and Michel Foucault’s scholarship on the topic, see Alberts, *supra* note 109; Lars Botin, *The Technological Construction of the Self: Techno-Anthropological Readings and Reflections*, 19 *TECHNÉ: RSCH. IN PHIL. & TECH.* 211 (2015).

The “ontological” novelty is that humans, thanks to science and technology, have become more dangerous for nature than nature once was for them:

Take, for instance, as the first major change in the inherited picture, the critical vulnerability of nature to man’s technological intervention—unsuspected before it began to show itself in damage already done. This discovery, whose shock led to the concept and nascent science of ecology, alters the very concept of ourselves as a causal agency in the larger scheme of things. It brings to light, through the effects, that the nature of human action has *de facto* changed, and that an object of an entirely new order—no less than the whole biosphere of the planet—has been added to what we must be responsible for because of our power over it.¹⁶¹

But the transformation provided by the awareness of the vulnerability of nature that comes from the human’s own capability of studying and understanding more and more the effect of their own actions through sound science-based analysis is associated, inevitably, with the awareness of their vulnerability as a member of the human species. This vulnerability is essentially part of nature itself and is also in a technically manipulated and therefore unpredictably dangerous environment. On one hand, these transformations call for overturning the ethical perspective itself. The problem is that the modern ethical tradition of the West remains anchored to the moral quality of the concept of acting in the present and not in the future. On the other hand, it is not projected onto the unpredictable and indeterminate long-term consequences of our actions. Affirming, as Immanuel Kant did, that “I ought never to act except in such a way that I can also will that my maxim should become a universal law,”¹⁶² means that humans must act now by respecting other’s freedoms because not doing so would mean accepting, for the sake of logical consistency, possible violations of their own freedom by others in the future. This entails a duty with respect to the mutual and present relationships of humans but not with respect to the humanity that in itself takes place in history. The categorical imperative directly evokes the concept of humanity, as when Kant writes: “Act in such a way that you always treat humanity, whether in your own person or in the person of any other, never simply as a means, but always at the same time as an end.”¹⁶³ However, the imperative refers to an agent and another who live a common present, unless you understand the “otherness” discussed here in a trans-temporal category.

¹⁶¹ JONAS, *supra* note 1, at 6–7.

¹⁶² IMMANUEL KANT, *GROUNDWORK OF THE METAPHYSIC OF MORALS* 70 (H.J. Paton trans. & ed., Harper Torchbook 1964) (1785).

¹⁶³ *Id.* at 96.

But this last meaning of the term “otherness,” in relation to Kant’s discussion, must be excluded according to Jonas’s interpretation. The categorical imperative implies an agreement of reason with itself. It assumes the existence of a society of rational human agents, and given this assumption, the action must be able to be thought of without any self-convolution as an acceptable practice on the part of the existing community. The logical need to avoid self-conflict, in other words, considers as a reference area—also logical and not moral—the present humanity and not the future. As Jonas argues, from this point of view, “[t]here is no self-contradiction in the thought that humanity would once come to an end, therefore also none in the thought that the happiness of present and proximate generations would be bought with the unhappiness or even nonexistence of later ones.”¹⁶⁴ From the Kantian point of view, the problem arises from the difficulty, if not impossibility, of qualifying as rational subjects, to whom we must keep in mind when we perform actions today, individuals who do not yet exist and who, in a logical-theoretical sense, may never exist. At the end of the day, the moral universe is substantiated, according to this conception, in the horizon of contemporaneity, limiting the concept of time to be considered in both our reflections and the decision-making process solely to the present. These claims, with respect to our behaviors, come from those who live with us in the world, from those who currently feel influenced by our actions and omissions.¹⁶⁵

For Jonas, the synchronic ethics just described is “content,” as the basis of moral action, with a knowledge accessible to all people with good will. As Kant said, “human reason can, in matters of morality, be easily brought to a high degree of accuracy and precision even in the most ordinary intelligence,”¹⁶⁶ and, “there is no need of science or philosophy for knowing what man has to do in order to be honest and good, and indeed to be wise and virtuous.”¹⁶⁷ It would be precisely the limit provided by the synchronic contextualization of such an ethical approach to devalue the scientific contribution, especially that of a predictive nature, as a cognitive support of moral action. Moreover, Jonas points out that even classical ethics, such as Aristotelian ethics, which are certainly more sensitive toward the cognitive contribution to the moral choice, do not appeal to a properly theoretical science of a predictive type.¹⁶⁸ In the context of these ethical reflections, the knowledge of the situation depends on the experience and judgment that are

¹⁶⁴ JONAS, *supra* note 1, at 11.

¹⁶⁵ One of the most significant recent contributions to a rational and argumentative foundation of the imperative of responsibility to future generations is represented by Ferdinando G. Menga. *See, e.g.*, FERDINANDO G. MENGA, *LO SCANDALO DEL FUTURO: PER UNA GIUSTIZIA INTERGENERAZIONALE* [THE SCANDAL OF THE FUTURE: FOR INTERGENERATIONAL JUSTICE] (2016) (It.).

¹⁶⁶ KANT, *supra* note 162, at 59.

¹⁶⁷ *Id.* at 72.

¹⁶⁸ *See* JONAS, *supra* note 1, at 69, 138.

formed here and now, which do not presuppose a strictly scientific knowledge capable of predicting the long-term effects of the actions of each one and, a fortiori, the effects of the involuntary aggregation of the conduct of humans. “Good” and “evil” are identified in the context of a short-term context: “This ‘knowledge’ proper to virtue (of the ‘where, when, to whom, and how’) stays with the immediate issue, in whose defined context the action as the agent’s own takes its course and within which it terminates.”¹⁶⁹

Further, to the traits of traditional ethics, especially modern ethics (as a synchronic ethics devoid of the support of theoretical science), is also added, according to Jonas, the fundamentally anthropocentric character deriving from a strictly infrahuman conception. The impact on non-human objects is not relevant in the context of this ethical tradition precisely because the whole field of *techne*, such as manual knowledge, is not perceived for objective historical reasons as an activity capable of questioning the self-preservation of nature. In the period prior to the Anthropocene epoch, the very question of the possibility of permanent damage to the integrity of the natural environment was not seriously raised “because *techne* as an activity conceived itself as a determinate tribute to necessity and not as an indefinite, self-validating advance to mankind’s major goal, claiming in its pursuit man’s ultimate effort and concern.”¹⁷⁰ So, this conceptualization for the modern ethics before the Anthropocene does not only exclude future generations from the paradigm, it also automatically removes the role of nature and non-humans because of their equal status as nonrational subjects, from our own perspective, interpretation, and the analysis of reality. But these non-humans are actually living in the present, without the possibility of expressing, in our human language, their disagreement about the human choices and actions that affect their habitats and their own existence.¹⁷¹ Numerous species are disappearing from the Earth because of global warming, deforestation, and pollution.¹⁷² These are the missing links that represent the extinct species, damaging the natural evolution and ultimately our Earth’s biodiversity. Nature and non-humans, once again, do respond to rules other than humans’, not rationally identifiable in an anthropogenic term, and they have an equally different dimension of time based more closely on geological eras, namely centuries or millennia. Removing the actual negative impacts and damaging effects on nature and non-humans from the considerations about the decisions of humans irremediably endangers our Earth. It might also ultimately risk the extinction of the human

¹⁶⁹ *Id.* at 6.

¹⁷⁰ *Id.* at 4.

¹⁷¹ See *Sierra Club v. Morton*, 405 U.S. 727, 742, 749 (1972) (Douglas, J., dissenting) (“Inanimate objects are sometimes parties in litigation The voice of the inanimate object, therefore, should not be stilled.”).

¹⁷² See, e.g., WORLD WILDLIFE FUND & ZOOLOGICAL SOC’Y OF LONDON, LIVING PLANET REPORT 2022: BUILDING A NATURE-POSITIVE SOCIETY (2022), https://wwflpr.awsassets.panda.org/downloads/lpr_2022_full_report.pdf.

race, thereby leaving the Earth to be inhabited by other species capable of surviving the new environmental and climate conditions caused by the damaging actions of humans.

IV. HANS JONAS'S IMPERATIVE OF RESPONSIBILITY AS THE ETHICAL FOUNDATION OF CLIMATE JUSTICE

In Jonas's reading, the Western ethical tradition,¹⁷³ founded on a synchronic and anthropocentric conception, appears inadequate to face the moral dilemmas produced by the technological civilization of the second modernity. It is precisely the technological focus of contemporary human beings that requires a change of perspective. First of all, this reversal of paradigm passes from a conception of duty no longer limited in an anthropocentric sense. Following Jonas's lead, it is more than reasonable, in the context in which we live, to ask whether or not human beings have a duty to take care of the biosphere and protect biodiversity. The question of duty is one that is rationally based on the de facto domination, unprecedented compared to the past, of humans over the environment. But the recognition of the existence of a moral claim on the part of the biosphere does not presuppose a questionable representation of the anthropomorphization of the natural environment. In reality, it is equivalent to the adoption of a point of view placing, at the center, rational subjects as integral parts of the environment to be preserved.

From a natural science and geographical perspective, nature and the environment are more rational than, or at least as rational as, human beings. Non-humans and humans have always had similar self-preservation instincts and a fundamental tendency to behave in a manner that avoids injury and maximizes chances of survival.¹⁷⁴ As from the Anthropocene epoch, it seems that a fracture has happened. The majority of humans have gradually moved from the countryside and now live in modern and industrialized cities or locations far from nature.¹⁷⁵ In most cases, they do not need to fight to provide food, water, and/or shelter to their families, and they do not have an

¹⁷³ For scholarship applying ethics to the environment, see Christopher B. Barrett & Ray Grizzle, *A Holistic Approach to Sustainability Based on Pluralism Stewardship*, 21 ENV'T ETHICS 23 (1999); ETHICS AND POLITICS OF SPACE FOR THE ANTHROPOCENE, *supra* note 5; Susan Jane Buck Cox, *No Tragedy on the Commons*, 7 ENV'T ETHICS 49 (1985); Farah & Prityi, *supra* note 5; SIMONE DE BEAUVOIR, *THE ETHICS OF AMBIGUITY* (Bernard Frechtman trans., Citadel Press 2d ed. 1962). For preliminary readings in this context on how China approaches the ethical understanding of the relationships between humans and nonhumans, see CONFUCIAN POLITICAL ETHICS (Daniel A Bell ed., 2008); Paul D'Ambrosio, *Rethinking Environmental Issues in a Daoist Context: Why Daoism Is and Is Not Environmentalism*, 35 ENV'T ETHICS 407 (2013); THOMAS TAYLOR MEADOWS, *THE CHINESE AND THEIR REBELLIONS* (Cambridge University Press 2015) (1856).

¹⁷⁴ See Dean Mobbs et al., *The Ecology of Human Fear: Survival Optimization and the Nervous System*, 9 FRONTIERS NEUROSCI. 55 (2015).

¹⁷⁵ See Ralf Seppelt & Graeme S. Cumming, *Humanity's Distance to Nature: Time for Environmental Austerity?*, 31 LANDSCAPE ECOLOGY 1645 (2016).

immediate perception of how nature and biodiversity are more and more affected by industrialization, the related means of production, global commercialization, and their overgrowing needs connected to both consumerism and market demands. Consequently, because of their lack of awareness of the impending risk and their distance from nature, human beings did not immediately realize the need to reverse their actions, which are endangering the environment, because their self-preservation instinct was not triggered by the external factors that are more visible in nature. Nature follows rules that are certainly rational and include rational subjects in the paradigm, but with very different categories and perspectives than human equivalents. Anthropocentrism is a structural trait of ethical reasoning, despite Jonas's claim to neutralize it. But it can take on a moderate connotation if the very concept of the environment is understood as the synthesis and coexistence of nature and culture, as a biosphere and biodiversity and human presence. On the other hand, the representation of the Anthropocene epoch surely leads to such a conception of the environment. If so, environmental rights¹⁷⁶ lose any ideological characterization to assume a rational foundation from an ethical point of view. If this is the case, as Jonas maintains, "[i]t would mean to seek not only the human good but also the good of things extrahuman, that is, to extend the recognition of 'ends in themselves' beyond the sphere of man and make the human good include the care for them."¹⁷⁷ The synchronic foundation of traditional ethics should, therefore, be questioned. The rights of future generations should coincide and be positively combined with environmental law in a diachronic and therefore trans-temporal perspective. Thus, a new moral imperative, adapted to such a change of perspective, would be: "Act so that the effects of your action are compatible with the permanence of genuine human life."¹⁷⁸

This is an imperative based on the level of historical rationality, starting from the awareness of the potential of contemporary technology that is able to produce structurally and incessantly long-term effects. How technology is integrated into the biosphere will have consequences that affect the complex environment provided by humans. This new imperative is one that, on a strictly ethical level, is justified considering that, before respecting the freedom of others to do anything that does not violate freedom, we must

¹⁷⁶ For preliminary readings connecting human rights and the protection of the environment, see EMILY REID, *BALANCING HUMAN RIGHTS, ENVIRONMENTAL PROTECTION AND INTERNATIONAL TRADE: LESSONS FROM THE EU EXPERIENCE* (2015); Richard P. Hiskes, *Environmental Human Rights and Intergenerational Justice*, 7 *HUM. RTS. REV.* 81 (2006); Anja Meyer, *International Environmental Law and Human Rights: Towards the Explicit Recognition of Traditional Knowledge*, 10 *REV. EUR. COMPAR. & INT'L ENV'T L.* 37 (2001); Knox, *supra* note 82; Hiskes, *supra* note 142; Dinah Shelton, *Whiplash and Backlash – Reflections on a Human Rights Approach to Environmental Protection*, 13 *SANTA CLARA J. INT'L L.* 11 (2015).

¹⁷⁷ JONAS, *supra* note 1, at 8.

¹⁷⁸ *Id.* at 11.

allow those other people in a trans-temporal sense to exist as moral subjects. The principle of the responsibility of humans toward future generations, which bases the rights of each generation on the basis of the duties of the present generation, is philosophically justified by the first purpose of humanity, which is to continue to exist. This principle feeds on fear, in the sense of apprehension for the vulnerability of those who do not yet exist (on the model of the ethics of parental responsibility). This fear should lead to prudent public action to intervene, as a precaution, as enshrined, for example, in Principle 15 of the Rio Declaration, which states: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation.”¹⁷⁹ Principle 15 can be deduced from Jonas’s imperative, which is aimed mainly at public policy and not directly at the behavior of private individuals. Again, Jonas’s ethics of responsibility differs from Kant’s view. The coherence invoked by Jonas’s imperative and the principle of responsibility is, in fact, one that should be between the ultimate effects of our actions and the permanence of human activity in the future. For this reason, the causal order of reference is not provided by private behavior but by political choices of a collective nature. The universalization that this imperative implies is not hypothetical, as in the Kantian case of the logical projection of the subject with respect to the representation/imagination of all the others. Instead, it is a universalization that is measured on the basis of the practical success calculated over the time horizon of the future. Therefore, the ethics of responsibility feeds on the cognitive contribution provided by predictive science. It is on the basis of this contribution, in fact, that its success is measured.

All this returns us to the background from which we started. It brings us to the framework of the global world and the awareness of the need to remedy the political failure of globalization. Jonas’s ethics of responsibility acquires, in fact, full meaning only in a global perspective and calls into question the establishment of effective political structures of governance of globalization capable of affecting an emblematically global phenomenon such as climate change.¹⁸⁰ But the ethics of responsibility also makes it possible to pull the threads of reflection on the relationship between science, technology, and the Anthropocene. Responsibility toward future generations is justified because of technical domination, as the result of a self-perpetuating process, and the evidence of the Anthropocene as an environmental and anthropic result of this domain. In other words, the principle of responsibility is

¹⁷⁹ Rio Declaration, *supra* note 115, at 3; *see also* Howse, *supra* note 61; TECHNOCRACY AND THE LAW: ACCOUNTABILITY, GOVERNANCE AND EXPERTISE, *supra* note 47.

¹⁸⁰ *See* Farah & Prityi, *supra* note 5.

supported by the very fact of a technically manipulated environment that risks calling into question the conditions for the permanence of human life. At the same time, in light of the relationship between technology and the Anthropocene, it is clear that the ethics of responsibility represents a rational foundation for the conception of climate justice. If taken seriously, the environmental ethics here, sketched and reworked from a starting point of Jonas's reflections, stands in contrast with the techno-economic model that dominated the second modernity. As Jonas wrote:

The object's self-owned futurity is the truest futural aspect of the responsibility,¹⁸¹ which thus makes itself the guardian of the very source of that irksome unpredictability in the fruits of its labors. Its highest fulfillment, which it must be able to dare, is its abdication before the right of the never-anticipated which emerges as the outcome of its care. Its highest duty, therefore, is to see that responsibility itself is not stifled, whether from its source within or from constraints without. In the light of such self-transcending width, it becomes apparent that responsibility as such is nothing else but the moral complement to the ontological constitution of our *temporality*.¹⁸²

Unlike the perspective provided by ecological modernization, the ethics of responsibility makes it possible to theoretically institute collective choices that can lead to rethinking models of development, production processes, and lifestyles. Climate justice, as an aspiration not only for a fair distribution of the costs of climate change but also of political responsibilities, can bring about a reversal of the trend in public institutional choices. This reversal can occur only if it identifies, as the basis of its proposal, the protection of vulnerability¹⁸³ understood in a radical sense by embodying within its theoretical framework future generations and their rights. From this perspective and focus, rationally based on the ethical and not the ideological level, it is factually consequential and politically sustainable to expand the protected subjects to include the most vulnerable groups in the present time. But to achieve this result, it is necessary that a global and universal projection of the aspirations of climate justice occurs. Further, this projection must coincide with the rights of the future generations and therefore of the preservation of a healthy environment in which they will live. There is no gap between present vulnerability and future vulnerability;

¹⁸¹ For more on the principal of responsibility, see Alberts, *supra* note 109; Steven Bernstein, *The Absence of Great Power Responsibility in Global Environmental Politics*, 26 EUR. J. INT'L RELS. 8 (2020); Honkonen, *supra* note 82.

¹⁸² JONAS, *supra* note 1, at 107.

¹⁸³ See Parks & Roberts, *supra* note 20; Alice Atieno Oluoko-Odingo, *Vulnerability and Adaptation to Food Insecurity and Poverty in Kenya*, 101 ANNALS ASS'N. AM. GEOGRAPHERS 1 (2011); Kasperson & Kasperson, *supra* note 81; VULNERABILITÀ: ANALISI MULTIDISCIPLINARE DI UN CONCETTO, *supra* note 151; ZANETTI, *supra* note 151.

they are two faces of the same coin. By protecting the latter, justice is done for the former in the name of the continuity of the species (and bearing in mind the hope of eternity and the wishes of infinity well above us), which allows us to belong to humanity beyond our historical time.