
AN ANALYSIS OF EARTH SYSTEM APPROACH TO THE GLOBAL PACT FOR THE ENVIRONMENT

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1 Introduction

‘Earth system’ refers to Earth’s physical, chemical and biological processes interacting with one another. The system consists of the land, oceans, atmosphere and poles. It also includes the planet’s natural cycles – the carbon, water, nitrogen, phosphorus, sulphur and other cycles.² The integrity of Earth systems is eroding at a rapid pace and it has become more apparent than ever. We are faced with unprecedented socio-ecological crisis that gravely threatens all life on Earth. Human activities are increasingly crossing the planetary boundaries, which is pushing the Earth to enter into an Anthropocene era – an era which is altogether a more unpredictable and unstable geological epoch.

The socio-ecological crisis of the Anthropocene era should be viewed as a critical existential crisis, which requires sweeping and radical interventions at all regulatory levels. As the broader socio-ecological implications of the Anthropocene are increasingly illuminated and appreciated by the global scientific community, many states seem to recognize the need for global environmental law/Pact, politics and governance to more fully embrace the Earth system integrity.³

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² Will Steffen et al, ‘The Emergence and evolution of Earth System Science’ 1 *Nature Reviews Earth & Environment* (2020) 54-63. The Earth System refers to ‘the suite of interacting physical, chemical, and biological global scale cycles (often called biogeochemical cycles) and energy fluxes which provide the conditions necessary for life on the planet’. Will Steffen, Paul J. Crutzen and John R. McNeil, ‘The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature’, 36 *AMBIO* (2007) 614-621.

³ Louse Kotze, ‘A Global Environmental Constitution for the Anthropocene?’ 8(1) *Transnational Environmental Law* (2019) 11-33.

The Anthropocene concerns the entire Earth system and yet, there is no legal mechanism to protect the global commons and the Earth system. This research paper opens a detailed inquiry into the need for the Global Pact for the environment⁴ to adopt an Earth system approach to protect and preserve the Earth's wholeness.

This paper does not aim to be a detailed enquiry into the successes and failures of global environmental law and governance, but more importantly to introduce Anthropocene into the legal domain. The reason this becomes imperative is because since the disruptions of the Anthropocene have begun, and will continue to increase, human society needs to guide its adaptation by recognizing a new set of legal principles – that need to be rapidly embraced if they are to be effective.⁵

This paper begins by exploring and analyzing the Anthropocene epoch, the challenges that come with it and how the scientific, legal and political communities have responded to the socio-ecological challenges. With this analysis in the backdrop, the paper moves on to explore the Earth system complexities and the role and relevance of sovereignty to govern the global commons in the Anthropocene. Furthermore, the paper scrutinizes specific implications of the Anthropocene and Earth system complexities on international environmental law (IEL) – and specifically analyzes the crucial role of 'ecological integrity' as a core objective of multilateral environmental agreements (MEAs) and of public trusteeship to protect and preserve the Earth's wholeness. Finally, this paper argues for the need to have a Global Pact for the Environment that adopts an Earth systems approach. For the Pact to achieve its goal of providing for Earth governance – the paper asserts and concludes that there is a need to see nation-states as stewards of the Earth, wherein states acting as trustees of the common good can potentially have important legal implications to stay within the scientifically defined planetary boundaries.

2 The age of the Anthropocene

2.1 Introduction

For at least the last 11,000 years, the Earth system has maintained an unusually stable and warm climate, a condition conducive to the rapid spread of homo sapiens over the planet and the subsequent development of human civilizations. With the onset of the Industrial Revolution, however, human societies have emerged as a major geophysical force capable of modifying, inter alia, the chemical composition of the atmosphere, hydrosphere and geo-sphere. As a result, multiple biophysical

⁴ See <<https://globalpactenvironment.org/en/>>.

⁵ Nicholas A Robinson, 'Fundamental Principles of Law for the Anthropocene?' 44(1-2) *Environmental Policy and Law* (2014) 13-27.

thresholds have been, or are about to be, transgressed, pushing the Earth system into the Anthropocene, where humanity may be at risk of survival.⁶

Geo-ecologically speaking, the Anthropocene refers to a period in which humans dominate the geo-ecological epoch by acting as a major driving force in modifying the environment.⁷ In other words, it refers to the age in which humans have the capability to alter the 'Earth systems' and planetary boundaries. Although there is some disagreement among scholars on the exact inception of this era,⁸ the majority consensus lies during the mid-twentieth century, when the Holocene era had to give way to an epoch defined by nuclear tests,⁹ plastic pollution (both in the oceans and on land), among others, that caused human footprints to become over-whelming for our planet.

According to Professor Jan Zalasiewicz, '[t]he significance of the Anthropocene is that it sets a different trajectory for the Earth system, of which we of course are part'.¹⁰ Advertent critiques have been quick to point out that the Anthropocene era is very short in geological terms, while Prof Jan's response to that is that 'many of the changes are irreversible'.¹¹

A formal definition put forth by Steffen, Crutzen and Mc Neill is of particularly relevant significance to this context:

The term Anthropocene... suggests that the Earth has now left its natural geological epoch, the present interglacial state called the Holocene. Human activities have become so pervasive and profound that they rival the great forces of Nature

⁶ Independent Group of Scientists appointed by the UN Secretary-General, 'The Future is now' Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development (UN, 2019), available at <https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf> (visited 6 September 2020).

⁷ Mike Hodson and Simon Marvin, 'Urbanism in the Anthropocene: Ecological Urbanism or Premium Ecological Enclaves?', 14 *City* (2010) 298-313. The extent of human impacts on Earth has been documented extensively in many disciplines and contexts. In the context of the Anthropocene, see among others: Ron Wagler, 'The Anthropocene Mass Extinction: An Emerging Curriculum Theme for Science Educators', 73 *The American Biology Teacher* (2011) 78- 83; Juan J. Armesto et al, 'From the Holocene to the Anthropocene: A Historical Framework for Land Cover Change in Southwestern South America in the Past 15,000 Years', 27 *Land Use Policy* (2010) 148-160; Ignacio Ayestaran, 'The Second Copernican Revolution in the Anthropocene: An Overview', 3 *International Journal Sustainability, Technology and Humanism* (2008) 146-157.

⁸ Giacomo Gertini and Riccardo Scalenghe, 'Anthropogenic Soils are the Golden Spikes for die Anthropocene', 21 *The Holocene* (2011) 1269-1274; Ananda Gunatilaka, 'The Anthropocene – A 200 Year Record of Human Driven Geological Impacts: Prelude to Global Climate Changes and Implications for South Asia', 37(1) *Journal of National Science Foundation of Sri Lanka* (2009) 3-11.

⁹ Jan Zalasiewicz et al, 'A Stratigraphic Basis for the Anthropocene?', 395 *Geological Society, London* (2014) 1- 21.

¹⁰ Damian Carrington, 'The Anthropocene epoch: scientists declare dawn of human-influenced age', *the Guardian* of 29 August 2016, available at <<https://www.theguardian.com/environment/2016/aug/29/declare-anthropocene-epoch-experts-urge-geological-congress-human-impact-earth>> (visited 29 July 2020).

¹¹ *Ibid.*

and are pushing the Earth into planetary terra incognita. The Earth is rapidly moving into a less biologically diverse, less forested, much warmer, and probably wetter and stormier state.¹²

This definition not only helps us understand the implications of human actions on the planet, but also puts us on a narrative path that is unsettling for humanity. We have a very limited amount of time to correct our actions; otherwise, humanity is potentially on the brink of greater catastrophic events that will wipe out our ecosystems.

2.2 Scientific responses to challenges

The growing scientific realities project a grim future if humanity does not steer away from pushing the planetary boundaries to its ‘tipping points’.¹³ The urgency of the situation has led to a wide range of literature from different fields, including, for instance, geo-engineering approaches, aimed at mitigation and/or Earth system restoration through latest technological interventions.¹⁴ While technological interventions¹⁵ indeed play a crucial role in responding to the socio-ecological crisis we are faced with, moral and ethical commitments to other humans and for Earth’s wholeness is what is essential.

A critical (often taken for granted) response to the Anthropocene challenge involves transforming people and the socio-institutional frameworks through which we can mediate the human-environment interface.¹⁶ A radical shift in the thought-processes that question the urgency of global social policy is vast enough to permit the luxury of ethical deliberation needed to tackle the challenges of the Anthropocene era.¹⁷ The uniqueness of this epoch is that, for the first time, man will be placed on human

¹² Will Stephen et al, ‘The Anthropocene: Are’, *supra* note 2, at 614. See also, Eva Lovbrand, Johannes Stripple and Bo Wiman, ‘Earth System Governmentality: Reflections on Science in the Anthropocene’, 19 *Global Environmental Change* (2009) 7-13.

¹³ Barry W. Brook, Erle C. Ellis, and Jessie C. Buettel, ‘What is the evidence for Planetary tipping points?’ in Peter Kareiva, Michelle Marvier and Brian Silliman (eds), *Effective Conservation Science: Date Not Dogma* (Oxford University Press, 2018) 51-57.

¹⁴ See, for instance, David W. Keith, ‘Geo-engineering the Climate: History and Prospect’, 25 *Annual Review of Energy and the Environment* (2000) 245-284; Bala Govindswamy and Ken Caldeira, ‘Geo-engineering Earth’s Radiation Balance to Mitigate CO₂-induced Climate Change’, 27 *Geophysical Research Letters* (2000) 2141-2144; B. Wharf and S. Arias (eds), *The Spatial Turn: Interdisciplinary Perspectives* (New York, Routledge, 2009); Peter Haff, ‘Humans and Technology in the Anthropocene: Six Rules’, 1(2) *The Anthropocene Review* (2014) 126-136.

¹⁵ See, for instance, David Leary and Balakrishna Pisupati, ‘Emerging Technologies: Nanotechnology’ at 227-246; Richard L. Ottinger and Victor M. Tafur, ‘Legal Frameworks for emerging technologies: Bio-energy’ at 247-268; Michele S. Garfinkel and Robert M. Friedman, ‘Synthetic biology and synthetic genomics’ at 53-70. All in David Leary and Balakrishna Pisupati. (eds), *The Future of International Environmental Law* (United Nations University Press, 2010), available at <<https://collections.unu.edu/eserv/UNU:2518/ebrary9789280811926.pdf>> (visited 28 April 2020).

¹⁶ Sarah Krakoff, ‘Parenting the planet’ in Denis G. Arnold (ed), *The Ethics of Global Climate Change* (Cambridge University Press, 2011) 145-169.

¹⁷ See Upendra Baxi, ‘Towards a Climate Change Justice Theory?’, 7 *Journal of Human Rights and the Environment* (2016) 7-31.

and human-induced global ecological change and acts like a ‘mirror’, where humanity is only going to see the (destructive) reflections of previous actions.

2.3 Legal responses to challenges

Compared to the advancement of scientific and technological resilience mechanisms developed as a response to the Anthropocene, the legal domain is considerably lagging in developing a comprehensive analytical framework to tackle socio-ecological challenges.

This is perhaps because law presents us with a paradoxical outlook. More specifically, environmental law has indeed played a role in making us push our planetary boundaries to tipping points. Law is also needed to carry out central reforms that could potentially help cope with the challenges we are now faced with in the Anthropocene era. As Robinson points out in his work,¹⁸ looking at law through the lens of the Anthropocene could potentially reveal the historic and continuing contribution of law towards enabling a multitude of Anthropogenic’ causes and realities. These include (but are not limited to) the enclosure of the commons; the dispossession of indigenous people under colonialism; the continuing corporate neo-colonialism and the resulting ecological ravaging and asymmetrically distributed patterns of advantages and disadvantages that prevail in the society.¹⁹

Barring a few exceptions,²⁰ there is nothing, as of yet, new in law that responds to Earth’s wholeness and complexity. Scholars have pointed out a ‘vacuum’ in the current institutional arrangements to effectively deal with multiple inter-locking complex processes resulting in future human and non-human well-being.²¹ Although the latest Global Pact for the Environment²² could potentially provide some respite, it still has a long way to go in the international community, and it will be a few years before we see a legally-binding Pact that appreciates and encompasses the Earth’s wholeness. (Global Pact for the Environment will be discussed in more detail in section four of this paper).

¹⁸ Nicholas A. Robinson, ‘Fundamental Principles of Law for the Anthropocene?’, 44 *Environmental Policy & Law* (2014) 13-27.

¹⁹ See further, Anna Grear ‘Deconstructing Anthropos: A critical Legal Reflection on “Anthropocentric” Law and Anthropocene ‘Humanity’, 26 *Law Critique* (2015) 225-246.

²⁰ See Tim Stephens, ‘Re-Imagining International Water Law?’, 71 *Maryland Law Review Endnotes* (2011) 20-40; Nicholas A. Robinson ‘Beyond Sustainability: Environmental Management for the Anthropocene Epoch’, 12 *Journal of Public Affairs* (2012) 181-194; Rosemary Rayfuse, ‘The Anthropocene, Autopoiesis and the Disingenuousness of the Genuine Link: Addressing Enforcement Gaps in the Legal Regime for Areas Beyond National Jurisdiction’ in Erik J. Molenaar and Alex G. Oude Elferink (eds), *The International Legal Regime of Areas beyond National Jurisdiction. Current and Future Developments* (Brill, 2009) 163-190.

²¹ Victor Galaz, *Can We Bridge the ‘Anthropocene gap’? Global Environmental Governance, Technology and Politics: The Anthropocene Gap* (Edward Elgar, 2014).

²² Le club des jurists, ‘Global Pact for the Environment’ (International Union for Conservation of Nature (IUCN), available at <<https://www.iucn.org/sites/dev/files/content/documents/draft-project-of-the-global-pact-for-the-environment.pdf>> (visited 21 July 2020).

2.4 Political dimensions and disconnect with reality

There is a pattern of disconnect between the scientific realities of Earth systems, on the one hand, and international cooperation responses to deal with urgencies, on the other hand. We have witnessed this reality, time and again; for instance, with the call for climate change urgency, the attempts of the international community to take strong measures through treaties and conventions have repeatedly failed. This lack of urgency by the international community to undertake strong cooperative measures stems, arguably, from ‘fear.’ It is the fear of losing sovereignty, fear of complicating existing MEA regimes, fear of opening up established principles and their varied/contested application, and, most worrisome of all, fear of committing to steps that they lack the capacity to implement.²³

Take, for instance, the incident that just as the world’s nation states were to meet at the United Nations Conference on Sustainable Development (known as Rio+ 20) in June 2012, the US-based think tank Breakthrough Institute released a highly critical and widely spread review of a ‘planetary boundaries’ framework- a science based analysis of the risk of human activities.²⁴ The report questioned the underlying scientific evidence, the main results as well as the claim that the transgression of the suggested boundaries would have detrimental implications for human well-being.²⁵ Rio+20 agenda was made a re-draft called ‘zero draft’ declaration, that included an explicit reference to the need to stay within scientifically defined ‘planetary boundaries’.²⁶ This reference was removed from the document, due to scepticism within the US, Chinese and G77 delegations.

Another recent example is the third substantive session of the Ad Hoc Open-Ended Working Group of the Global Pact for the Environment which decided to adopt recommendations that were a clear retreat from the original proposals of a legally binding pact that could serve as a messiah to tackle the global environmental challenges of the Anthropocene era. Instead, they chose a ‘simple Political Declaration in 2022’, the content of which remains vague, and not a much needed international, legally binding treaty that would enshrine general principles of environmental law.²⁷

²³ International Institute for Sustainable Development (IISD), ‘Summary of the Third Substantive Session of the Ad Hoc Open-ended Working Group towards a Global Pact for the Environment 20-22 May 2019’, press release of 25 May 2019, available at <<https://enb.iisd.org/download/pdf/enb3503e.pdf>> (visited 21 July 2020) at 11.

²⁴ Linus Blomquist et al, ‘Does the Shoe Fit? Real versus Imagined Ecological Footprints’, 11 *PLoS Biology* (2012) 1-7.

²⁵ Think-tank produced reports of this sort are overly common, but a successful spin in international media is not. The *Scientific American* (Biello 2012), *The Economist* (2012), and *The Wall Street Journal* (2012) all described the contents of the Report. The timing was excellent from a lobbying point of view.

²⁶ See Stakeholder Forum for a Sustainable Future, ‘Review of implementation of Agenda 21 and Rio Principles – Detailed review of implementation of the Rio Principles’ (UN Department of Economic and Social Affairs, 2011), available at <https://sustainabledevelopment.un.org/content/dsd/dsd_sd21st/21_pdf/SD21_Rio_principles_study_complete.pdf> (visited 4 May 2020) at 13

²⁷ IISD, ‘Summary of the Third’, *supra* note 22, at 8.

The international policy framework on environmental law-making has constantly entered political gridlock, but the current age we are entering towards (some believe we are already in) requires an unprecedented international cooperation between nation states, civil societies and environmental citizens. Due to the nature of the Anthropocene era, where catastrophic events will occur beyond sovereign territories (that we have created for ‘political convenience’), it is obvious that the response should also be global in nature beyond national jurisdictions.

With this in the backdrop, the aim of the next section is to explore the facets of the Earth system complexity that justifies the need for re-defining the current legislative framework and policy-making. The paper argues in favour of a strong international legally binding instrument that protects the environment and the ecological integrity of the planet.

2.5 (IR)Relevance of state sovereignty in the Anthropocene era

Above, I discussed the growing Earth system complexities that are increasingly putting pressure on humanity to develop environmental legal regimes with international cooperation, due to the complexities of the anthropogenic era. This makes us question how the relevance of state sovereignty manifests in the Anthropocene era.

If there is relevance, how do we deal with consensus issue – where few major big states override and dominate most of the smaller states in favour of environmental decisions? If there is no longer relevance, how do we empower international environmental politics to take stringent measures to tackle catastrophic consequences of socio-ecological complexities?

After the world-wars concluded, the need of individual sovereign nations to strive to become the dominant force on the face of Earth led to large-scale exploitation of natural resources.²⁸ All efforts made within an intention to protect the environment were limited by territorial border efforts. Scholars²⁹ have advocated for the need to ‘redefine national security’ to encompass a broad array of threats, ranging from earthquakes to environmental degradation. Furthermore, US Senator Albert Gore spoke extensively in favour of thinking of the environment as a national security issue.³⁰ During the renewed cold war tensions of the late 1970s and early 1980s, such

²⁸ Micheal S. Dukakis, ‘Environmental Politics in post-world war II America’, 18 *Resources, Conservation and Recycling* (1996) 5-9; Samuel P. Hays, ‘The Environmental Movement’, 25 *Journal of Forest History* (1981) 219-221; Nico Schrijver, *Sovereignty over natural resources* (Cambridge University Press, 1997) 368-395.

²⁹ See Lester R. Brown, ‘Redefining National Security’, Worldwatch paper, No.14 (1977), available at <<https://files.eric.ed.gov/fulltext/ED147229.pdf>> (visited 4 May 2020); Jessica Tuchman Mathews, ‘Redefining Security’, 68(2) *Foreign Affairs* (1989) 162-77; Michael Renner, *National Security: The Economic and Environmental Dimensions* (Worldwatch Institute, 1989); and Norman Myers, ‘Environmental Security’, 74 *Foreign Policy* (1989) 23-41.

³⁰ Nicholas John Spykman, *America’s Strategy in World Politics: The United States and the Balance of Power* (Harcourt, Brace and Co., 1942).

concepts were advanced to prevent excessive military threats and, as the cold war winds went down, such links became increasingly popular among national security experts and organizations looking for new missions.³¹

Meanwhile, during that period, the principles of international law emerged with a motive to protect and preserve state sovereignty from the interference of foreign states.³² The highest principle of international law is the recognition of state sovereignty. The sovereignty of nations sets certain limits in international law. States are the only acting participants, and not people, ethnic groups or interest groups. So, it can be deduced that between the need to protect the environment (for preserving sovereign self-interest) and the need to protect individual sovereign states from foreign interference (again, for preserving sovereign self-interest), led to the emergence of international environmental law.

Today's lack of power in international environmental politics is mirrored in the powerlessness of international environmental law. It shares limitations of general international law from which it emerged. International law regulates the legal relationships between nations and only between them; the affected people are not involved directly and can only bring influence in international legal developments to bear through their respective state. This exclusive role of the states leads to serious consequences, which obstruct the course of international ecological politics.³³

IEL, in a historical and systematic sense, is not suited to the problem of preserving the natural requirements of our existence because international law has not been 'designed' for the protection of collective or ecological interests.³⁴ Therefore, this raises an important question on the relevance of sovereignty in the modern day context of global environmental politics and law.

2.5.1 Problems of sovereignty over global commons

'Global Commons' is defined as those parts of the planet that fall outside national jurisdictions and to which all nations have access. International law identifies four global commons, namely the high seas, the atmosphere, the Antarctica and the outer space.³⁵ Unfortunately, global commons do not, as the name suggests, logically imply shared resources. Moreover, areas labelled as global commons are not any more

³¹ Daniel Deudney, 'The Case Against Linking Environmental Degradation and National Security', 19(3) *Millennium: Journal of International Studies* (1990) 461-476.

³² Michael Reisman, 'International Law after the Cold War', 84(4) *American Journal of International Law* (1990) 859-866.

³³ Klaus Bossellman, *When Two Worlds Collide: Society and Ecology* (RSVP Publishing Company Limited, 1995) 4-383.

³⁴ *Ibid.* at 75.

³⁵ See UN System Task Team on the Post-2015 UN Development Agenda, 'Global Governance and governance of the global commons in the global partnership for development beyond 2015' (OHCHR, OHRLLS, UNDESA, UNEP, UNFPA, 2013), available at <https://www.un.org/en/development/desa/policy/untaskteam_undf/thinkpieces/24_thinkpiece_global_governance.pdf> (visited 4 May 2020) 3.

protected than areas subject to sovereign utilization.³⁶ Global commons consist of resources that are generally guided by the principle of common heritage of humankind.³⁷ Resources of interest or value to the welfare of the community of nations – such as tropical rain forests and biodiversity – have lately been included among the traditional set of global commons as well, while some define the global commons even more broadly, including science, education, information and peace.³⁸ This raises the question of how sovereignty actually impedes the protection of global commons since states are driven by national interests and have been resisting to accepting responsibility for areas beyond natural jurisdiction.³⁹

2.5.2 Moving beyond the traditional notion of sovereignty towards Earth governance

As I have discussed above, the complexity of governing global commons with the Westphalian notion of sovereignty where each state's domestic affairs is exclusive to its territory is not going to protect against the socio-ecological crisis our planet is headed toward in the anthropogenic era. The complexities require a paradigm shift when contemplating the role and status quo of the all-powerful, sovereign Westphalian state and the global institutions through which it acts. This includes the status, role and legitimacy of global non-states actors and global state-sanctioned governance agents i.e. agents who hold authority to oversee and protect global commons; the role of soft laws and the global application and enforcement of state-based legal rules.

Notably, the complex socio-legal, political, economic and ecological realities of the Anthropocene fundamentally militates against orthodox conceptions of international environmental law and governance. This is because the state, which has originally been the sole actor and creator of international environmental law, no longer acts as viable solution. The Anthropocene era requires us to move beyond state-centric environmental law-making towards universal legal principles.⁴⁰ Environmental de-

³⁶ See, further, Klaus Bosselmann, 'Large-Scale Acquisitions of the Commons: The need for Earth Governance' in Laura Westra, Klaus Bosselmann and Virginia Zambrano (eds), *Ecological Integrity and Land Uses: Sovereignty, Governance, Displacements and Land Grabs* (Nova Science Publishers, 2019); Klaus Bosselmann, 'Reclaiming the Global Commons: Towards Earth Trusteeship' in Betsan Martin, Linda Te Aho and Maria Humphries-Kil (eds), *Responsibility. Law and Governance for Living Well with the Earth Law* (Routledge, 2018) 35-46; Klaus Bosselmann, 'Democracy, Sovereignty and the Challenge of the Global Commons' in Laura Westra, Janice Gray and Franz-Theo Gottwald (eds), *The Role of Integrity in the Governance of the Commons* (Springer, 2017) 51-65; Erin A. Clancy, 'Tragedy of the Global Commons', 5 *Indiana Journal of Global Legal Studies* (1998) 601- 619.

³⁷ Rüdiger Wolfrum, 'The Principle of the Common Heritage of Mankind' 43 *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* (1983) 312-337.

³⁸ UN System Task Team on the Post-2015 UN Development Agenda, 'Global Governance and', *supra* note 38, at 6.

³⁹ See further, Elinor Ostrom, *Governing the Commons. The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990).

⁴⁰ Louis J. Kotze 'Rethinking Global Environmental Law and Governance in the Anthropocene', 32(2) *Journal of Energy & Natural Resources Law* (2014) 121-156 at 156.

structions that are a consequence of the Anthropocene will not be limited to one jurisdictional boundary – hence, keeping in view that solutions for such problems also should stem beyond politically drawn boundaries.

In view of this, the Earth governance approach offers a solution to govern the commons where consensus-building ultimately resides with citizens, not with governments. It is appropriate, therefore, to perceive governments as trustees, acting for, and on behalf of, citizens as beneficiaries.⁴¹ This vision of trusteeship does not downgrade state governments, to the contrary: it assigns them immensely important responsible tasks. At the same time, it recognizes, in principle, that state governments may have certain obligations toward the rest of humanity. The public trust doctrine can serve as a useful starting point to the Earth trusteeship concept⁴² (see later this paper).

3 Earth system complexities and implications on international environmental law

The Earth is a complex system formed by a large variety of sub-systems (biosphere, atmosphere, lithosphere as well as social and economic systems etc.) which interact by the exchange of matter, energy and information. Because of these inter-relations, the Earth is a complex and evolving network. We may choose to consider each subsystem separately, but the growing understanding of the whole system Earth suggests that one should consider the interactions between these subsystems.⁴³

Over the past few decades, evidence has been mounting that planetary-scale changes are occurring rapidly in response to the forcing and feedbacks that characterize the internal dynamics of the Earth system.⁴⁴ Scientific revelations have informed us on four aspects of the Earth system that illustrate how human enterprises are pushing towards ‘planetary terra incognita’.⁴⁵ This phenomenon of global change represents a profound shift in the relationship between humans and the rest of nature. The four aspects mentioned are non-linearity, catastrophic shifts, tipping points and scale. To begin with, complex social-ecological systems which underpin human and non-human well-being – such as coral reef ecosystems, agro-ecological landscapes, forests

⁴¹ Klaus Bosselmann, ‘Governing the Global Commons: The planetary boundaries approach’, 13(1) *Policy Quarterly* (2017) 37-42.

⁴² Peter H. Sand, ‘The Rise of Public Trusteeship in International Environmental Law’, Global Trust Working Paper Series 03/2013 (2013), available at <<http://globaltrust.tau.ac.il/wp-content/uploads/2013/08/Peter-Sand-WPS-3-13-ISSN.pdf>> (visited 5 May 2020).

⁴³ Reik Donner et al, ‘Understanding the Earth as a complex system – recent advances in data analysis and modelling in Earth Sciences’, 174 *European Physical Journal Special Topics* (2009) 1-9.

⁴⁴ Will Steffen et al, *Global Change and the Earth System. A Planet under Pressure* (Springer, 2004) 4.

⁴⁵ Will Steffen, et al, ‘The Anthropocene: Are’, *supra* note 2, at 614, See further, Victor Galaz, *Global Environmental Governance, Technology and Politics – The Anthropocene Gap* (Edward Elgar, 2014) 1-15.

and freshwaters – can shift with irreversible damage.⁴⁶ The next aspect is the scale. The non-linear properties of vital social-ecological systems are not limited to regional or local scale examples. The potential of irreversible shift in the Earth systems, abrupt climate change,⁴⁷ tipping elements in the Earth system,⁴⁸ planetary boundaries,⁴⁹ and a proposed possible state-shift in the Earth's biosphere⁵⁰ are all examples of attempts to explore the possibility of rapid, aggregated and destructive change on global scale.

These aspects reveal to us that we are no longer able to predict how the deterioration of the ecosystem can affect the processes and functionality at the planetary scale and how ecosystems themselves may react to disturbance. What we do know, however, is we must bring to scale human interference beyond the planetary boundaries and ensure we do not cross the safe operating space for humans. One important conclusion is that the 'boundaries' presently perceived as 'safe' could move over time as the Earth system, or our understanding of it, evolves. This dynamic interplay between systems behaviours, values and politics, should be considered in the environmental decision-making processes.

3.1 Implications on international environmental law

The ideal central over-arching purpose of international environmental law is to achieve socio-ecological integrity and ensure that humans do not step outside the planetary boundaries.⁵¹ MEAs have been developed to perform the primary function of steering the world towards a path of achieving 'sustainable development'⁵² (especially since the Stockholm Declaration).⁵³ However, commentators have pointed out that since its inception, owing to the relatively stable Holocene era's conditions,

⁴⁶ See Sandra Diaz et al, 'Summary for Policy Makers of the Global Assessment Report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services', (PBES secretariat, 2019), available at <https://ipbes.net/sites/default/files/2020-02/ipbes_global_assessment_report_summary_for_policymakers_en.pdf> (visited 4 May 2020) at 11.

⁴⁷ Richard B. Alley et al, 'A report of Working Group I of the Intergovernmental Panel on Climate Change. Summary for Policymakers' in Susan Solomon et al, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC, 2007), available at <<https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-spm-1.pdf>> (visited 22 July 2020).

⁴⁸ Timothy M. Lenton et al, 'Tipping elements in the Earth's climate system', 105(6) *Proceedings of the National Academy of Sciences* (2008) 1786-1793.

⁴⁹ Johan Rockstrom et al, 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity', 461 *Nature* (2009) 472-475.

⁵⁰ Anthony D. Barnosky et al, 'Approaching a state shift in Earth's Biosphere', 486 *Nature* (2012) 52-58.

⁵¹ Rakhyun E. Kim and Klaus Bosselmann, 'International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements', 2(2) *Transnational Environmental Law* (2013) 285-305; Geoffrey Palmer, 'New Ways to Make International Environmental Law', 86 *American Journal of International Law* (1992) 259-265.

⁵² A goal which in itself has been subject to criticism because of its anthropocentric ontology. See Sam Adelman, 'The Sustainable Development Goals, Anthropocentrism and Neo liberalism' in Duncan French and Louis Kotze (eds), *Sustainable Development Goals: Law, Theory and Implementation* (Edward Elgar, 2018) 15-40.

⁵³ Declaration of the United Nations Conference on the Human Environment, Stockholm, 16 June 1972, UN Doc. A/CONF.48/14/Rev.1 (1973), 11 *International Legal Materials* (1972) 1416.

IEL has performed its duties in *lex*.⁵⁴ It is now in the interest of not just humanity but for Earth's wholeness⁵⁵ that we need a radical approach and to re-think the law–governance–environment relationship.

MEAs have been particularly dynamic to respond to the community or *erga omnes* interest in environmental obligations. However, at the same time, MEAs have been heavily criticized for being the main reason for IEL's failure because their excessive proliferation has led to treaty regimes over-step planetary boundaries and breaching the safe operating space.⁵⁶ The rapid proliferation of IEL's instruments⁵⁷ has led to a fragmented and piece-meal approach to solving the global socio-ecological crisis. This fragmented approach⁵⁸ brings about the need to codify and make legally-binding consolidated established principles of IEL into a Pact. This will not only enable countries to formulate their domestic laws in-tune with the Pact, but also justify the legal basis for operating within the safe operating space for the humanity. This will enable humans to create an integrated and holistic approach in the law – governance – environment interface.

The lack of knowledge and understanding of the unfathomable scale of ecological disaster effects means that we need to become more equipped than ever by stricter policy-making structures and governance. The current approach of environmental decision-making processes at both regional and global levels relies on the prediction of the effects of commercial activities on the environment.⁵⁹ It is difficult to justify the prevention of harm to species or habitat in the monetary and hard-evidence demanding terms on which these debates are often conducted. Proponents of a stronger approach to sustainability argue that formal limits on economic growth, perhaps related to the preservation of substantive elements of the environment, must be identified and established in law to overcome this handicap for both environmental

⁵⁴ Davor Vidas et al, 'International Law for the Anthropocene? Shifting Perspectives in Regulation of the Oceans, Environment and Genetic Resources', 9 *Anthropocene* (2015) 1-13.

⁵⁵ See further, Klaus Bosselmann 'A Normative Approach to Environmental Governance: Sustainability at the apex of environmental law' in Douglas Fisher (ed.), *Research Handbook on Fundamental Concepts of Environmental Law* (Edward Elgar, 2016) 30-70.

⁵⁶ Tim Stephens, 'Re-imagining International Environmental Law in the Anthropocene' in Louis Kotze (ed), *Environmental Law and Governance for the Anthropocene* (Hart, 2017) 31-54.

⁵⁷ Rapid proliferation refers to the rate at which MEAs were being formulated to create a quick fix for the growing deterioration of ecological resources.

⁵⁸ For further readings, see: John Carter Morgan III, 'Fragmentation of International Environmental Law and the Synergy: A Problem and a 21 century model solution', 18(134) *Vermont Journal of Environment Law* (2016) 135-161; Christoph Humrich, 'Fragmentated International Governance of Arctic Offshore Oil: Governance challenges and Institutional Improvement', 13(3) *Global Environmental Politics* (2013) 79-99; Steven R. Ratner, 'Regulatory Takings in Institutional Context: Beyond the Fear of Fragmentated International Law' 102(3) *American Journal of International Law* (2008) 475-528.

⁵⁹ Richard K. Morgan, 'Environmental Impact Assessment: The State of the Art', 30 *Impact Assessment and Project Appraisal* (2012) 5-14; Jane Holder and Maria Lee, *Environmental Protection, Law and Policy* (2nd ed., Cambridge University Press, 2007) 548-51.

protection in current decision-making practices and for making development sustainable.⁶⁰

Despite the ‘uncertainty factor’, that decision-makers are faced with, I argue that it is not a novice territory for human civilization. Societies have historically managed probabilities and scenarios when building new infrastructure, managing energy supplies and when investing in new technologies. Currently, in certain pockets of the world, sovereign nations are trying to tackle the challenges of the Anthropocene era.⁶¹ These efforts may create an illusion that they are contributing to the bigger picture, but they are nothing more than solipsistic efforts operating within the politically created boundaries.

3.1.1 Ecological integrity as a core objective of MEAs

Ecological integrity helps clarify broader concepts like sustainability or a mutually enhancing human – Earth relationship. Many international agreements or soft law instruments refer to ecological integrity as an overarching, or at least a significant objective.⁶²

The notion of ecological integrity first appeared in the international arena in 1978 with the Great Lakes Water Quality Agreement,⁶³ signed bilaterally between Canada and the United States. The purpose of the Agreement is ‘to restore and maintain the chemical, physical and biological integrity of the Waters of the Great Lakes’.⁶⁴

The notion of ecological integrity has since been used as a key concept in a wide range of MEAs. The first MEA to include the notion was the Convention on the Conservation of Antarctic Marine Living Resources.⁶⁵ Adopted in 1980, the Convention recognized in its preamble ‘the importance of safeguarding the environment and protecting the integrity of the ecosystem of the seas surrounding Antarctica’.

Today, more than a dozen MEAs contain some reference to the integrity of ecosystems in their preamble or the operative part. In other major MEAs where the term did not appear in their texts, we may still observe that the underlying ideas are very

⁶⁰ *Ibid.* See also, Andrea Ross, ‘Modern Interpretations of Sustainable Development’, 36 *Journal of Law and Society* (2009) 32-54.

⁶¹ See, for instance, Carolina Zambrano-Barragán et al, ‘Quito’s Climate Change Strategy: A Response to Climate Change in the Metropolitan District of Quito, Ecuador’ in Konrad Otto-Zimmermann (ed.), *Resilient Cities: Cities and Adaptation to Climate Change. Proceedings of the Global Forum 2010* (Springer, 2011) 515-529.

⁶² Kim and Bosselmann, ‘International Environmental law’, *supra* note 45, at 305.

⁶³ Agreement between Canada and the United States of America on Great Lakes Water Quality, Ottawa, 22 November 1978, as amended on October 16, 1983 and on November 18, 1987, preceded by the Agreement between Canada and the United States of America on Great Lakes Water Quality, Ottawa, 15 April 1972.

⁶⁴ Article 2 of the Agreement.

⁶⁵ Convention on Conservation of Antarctic Marine Living Resources, Canberra, 20 May 1980, in force 7 April 1982, 19 *International Legal Materials* (1980) 841, <<http://www.ccamlr.org>>.

similar. For instance, the ultimate objective of the UN Framework Convention on Climate Change (UNFCCC),⁶⁶ which is to prevent dangerous anthropogenic interface with the climate system, can be interpreted to mean safeguarding the integrity of the climate system.

The Vienna Convention for the Protection of Ozone Layer⁶⁷ aims to protect human health and the environment against ‘adverse effects’, which it defines as ‘changes in the physical environment or biota, including changes in climate, which have significant deleterious effects on human health or on the composition, resilience and productivity of natural and managed ecosystems, or on materials useful to mankind’.⁶⁸ Here the objective is also to safeguard the integrity of the ozone layer.

The UN Convention on the Law of the Sea,⁶⁹ aims to protect against the ‘pollution of the marine environment’ which its Parties are obliged to prevent, reduce and control.⁷⁰ Again, the objective is to protect the integrity of the marine environment. The Ramsar Convention on Wetlands⁷¹ defines the wise use of wetlands as ‘the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development’,⁷² thereby incorporating elements of ecological integrity.

Perhaps more significantly, most of the key international environmental soft law instruments, including the World Charter for Nature,⁷³ the Rio Declaration on Environment and Development,⁷⁴ Agenda 21,⁷⁵ the Earth Charter,⁷⁶ the Plan of Implementation of the World Summit on Sustainable Development,⁷⁷ the Rio +20

⁶⁶ United Nations Framework Convention on Climate Change, New York, 9 May 1992, in force 21 March 1994, 31 *International Legal Materials* (1992) 849, <<http://unfccc.int>>.

⁶⁷ Convention on the Protection of the Ozone Layer, Vienna, 22 March 1985, in force 22 September 1988, 26 *International Legal Materials* (1985) 1529.

⁶⁸ Convention on the Protection of the Ozone Layer, Vienna, 22 March 1985, in force 22 September 1988, 26 *International Legal Materials* (1985) 1529. See further, Sharon A. Robinson and Stephen R. Wilson, ‘Environmental Effects of Ozone Depletion and its Interactions with Climate Change: 2010 Assessment’, available at <<https://ro.uow.edu.au/cgi/viewcontent.cgi?article=1495&context=scipapers>> (visited 5 May 2020).

⁶⁹ United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, in force 16 November 1994, 21 *International Legal Materials* (1982) 1261.

⁷⁰ Preamble.

⁷¹ Convention on Wetlands of International Importance, Ramsar, 2 February 1971, in force 21 December 1975, 11 *International Legal Materials* (1972), 963, <<http://www.ramsar.org>>.

⁷² Preamble.

⁷³ ‘World Charter for Nature’, UNGA Res. 37/7 of 28 October 1982.

⁷⁴ UN Declaration on Environment and Development, Rio de Janeiro, 14 June 1992, UN Doc. A/CONF.151/5/Rev.1 (1992), 31 *International Legal Materials* (1992) 876.

⁷⁵ Agenda 21, UN Conference on Environment and Development, Rio de Janeiro, 13 June 1992, UN Doc. A/CONF.151/26/Rev.1 (1992), available at <<https://sustainabledevelopment.un.org/outcomedocuments/agenda21/>>.

⁷⁶ See the Earth Charter Initiative (2000) <<http://earthcharter.org>>.

⁷⁷ Plan of Implementation of the World Summit on Sustainable Development, UN Doc. A/CONF.199/20 (2002).

Outcome Document ‘The Future We Want’⁷⁸ and the Paris Climate Agreement⁷⁹ contain the notion of ecological integrity in their cores.

This observation implies that many MEAs refer to ecological integrity as a significant objective⁸⁰ and in order to navigate the Anthropocene, Furthermore, a unifying objective of the Global Pact for the Environment needs to treat ‘ecological integrity’ as a fundamental core objective. (Ecological integrity will be further discussed with a specific reference to the Global Pact for the Environment in section 4 of this paper).

3.1.2 How far has the idea of public trusteeship for environmental resources progressed in the field of IEL?

Public trust doctrine refers to a legal concept with ancient roots that is based on the idea that certain natural resources cannot be fairly and effectively managed by private owners.⁸¹ Proposals to make use of the public trust doctrine in an international context date back to the 1893 Bering Sea Fur Seal Arbitration.⁸² They re-surfaced during preparations for the 1972 UN Stockholm Declaration and for the United Nations Economic, Social Cultural Organisation (UNESCO) World Heritage Convention,⁸³ and have since been taken up by several international scholars, especially in the legal debate on inter-generational equity.

Various forms of ‘trusteeship’, ‘guardianship’, ‘custodianship’ or ‘stewardship’ status have been suggested for the marine coastal environment in coastal waters and exclusive economic zones,⁸⁴ for continental shelf areas 60 to 120 miles beyond the

⁷⁸ Rio +20 Outcome Document ‘The Future We Want’, UNGA Res. 66/288 of 11 September 2012, available at <<https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>> (visited 15 February 2019).

⁷⁹ Paris Agreement to the United Nations Framework Convention on Climate Change, Paris, 12 December 2015, in force 4 November 2016; 55 *International Legal Materials* (2016) 740.

⁸⁰ Kim and Bosselmann, ‘International Environmental law’, *supra* note 45, at 295.

⁸¹ Mary Turnipseed and Raphael D Sagarin ‘The Public Trust Doctrine: Where Ecology Meets Natural Resources Management’, 37(1) *Annual Review of Environment and Resources* (2012) 473-496.

⁸² The arbitral tribunal established to solve the dispute in 1882 found that the United States had no property rights regarding the seals and no right to unilaterally prohibit sealing beyond the three-mile territorial sea limit. The tribunal thus upheld the doctrine of freedom of high seas. See Award of the Tribunal of Arbitration Constituted under the Treaty Concluded at Washington, 29 February 1892, between US and UK, 15 August 1893; Reproduced in 1 *IELR* (1999) 67; and 6 *AJIL* (1912) 233.

⁸³ Convention Concerning the Protection of the World Cultural and Natural Heritage, Paris, 16 November 1972, in force 17 December 1975, 11 *International Legal Materials* (1972) 1358, <<http://whc.unesco.org>>. Article 4 establishes a duty for each State to ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage in its territory.

⁸⁴ Casey Jarman, ‘The Public Trust Doctrine in the Exclusive Economic Zone’, 65 *Oregon Law Review* (1986) 1-33; Jack H. Archer and Jarman M. Casey, ‘Sovereign Rights and Responsibilities: Applying Public Trust Principles to the Management of EEZ Space and Resources’, 17 *Ocean and Coastal Management* (1992) 253-271; Richard Hildreth, ‘The Public Trust Doctrine and Coastal and Ocean Resources Management’, 8 *Journal of Environmental Law and Litigation* (1992) 221-236.

Exclusive Economic Zone (EEZ);⁸⁵ for marine resources in specific regional seas such as Mediterranean and the South Pacific;⁸⁶ for living ocean resources in general;⁸⁷ the much-quoted separate opinion on the 1997 *Gabčíkovo-Nagymaros* case, Judge Christopher G. Weeramantry of the International Court of Justice referred to a 'Principle of Trusteeship for Earth Resources'.⁸⁸

In July 1997, UN Secretary-General Kofi Annan proposed in his report on governance reform⁸⁹ reconstitution of the UN Trusteeship Council. The Council was one of the six principal organs of the UN established to enable member states exercise collective trusteeship for the integrity of the global environment and common areas including oceans, atmosphere and outer space.

Pursuant to this proposal, on the concept of trusteeship, the question was entrusted to the proverbial UN Committee – 'Task Force on Environment and Human Settlements' chaired by the Executive Director of UNEP. The task-force report to the General Assembly in October 1998 refrained from making any recommendation on trusteeship issue.⁹⁰

The buck was then passed to the 'Open-ended Inter-Governmental Group of Ministers on International Environmental Governance', launched by the UNEP Governing Council in February 2001, which predictably referred the matter to expert consultations, held in 2001. The experts concluded that 'it would be very difficult to undertake measures that would affect the main organs established by the UN

⁸⁵ The United States Draft of U.N Convention on International Seabed Area (1970), 9(5) *International Legal Materials* 1046-1080, Arts 26-28; See also Markus Schmidt, *Common Heritage or Common Burden? The United States Position on the Development of a Regime for Deep Sea-bed Mining in the Law of the Sea Convention* (Clarendon, 1989) 212-216.

⁸⁶ Evangelos Raftopoulos, 'The Barcelona Convention System for the Protection of the Mediterranean Sea against Pollution: An International Trust at Work', 7 *International Journal of Estuarine and Coastal Law* (1992) 27-41. See also Gracie Fong, 'Governance and Stewardship of the Living Resources: The Work of the South Pacific Forum Fisheries Agency' in Jon M. Van Dyke, Durwood Zaelke and Grant Hewison, (eds), *Freedom for the Seas in the 21st Century: Ocean Governance and Environmental Harmony* (Island Press, 1993) 131-141.

⁸⁷ Jon M. Van Dyke, 'International Governance and Stewardship of the High Seas and its resources' in Van Dyke et al, *Freedom for the, supra* note 71, at 13-22.

⁸⁸ Gabčíkovo-Nagymaros Project (Hungary/Slovakia), ICJ Judgment of 25 September 1997, *ICJ Reports* 1997 at 213; See also Separate Opinion of Vice-President Weeramantry, available at <<https://www.icj-cij.org/files/case-related/92/092-19970925-JUD-01-03-EN.pdf>> (visited 5 May 2020) at 151.

⁸⁹ 'Sustainable development and international economic cooperation International migration and development, including the convening of a United Nations conference on international migration and development. Report of the Secretary-General', UN Doc. A/52/314 (1997).

⁹⁰ 'Report of the Secretary-General on United Nations Reform Measures and Proposals: A New Concept of Trusteeship', UN Doc A/52/849 (1998); See Anil Agarwal, Sunita Narain and Anju Sharma (eds), *Green Politics: Global Environmental Negotiations* (Centre for Science and Environment, 1999) 1-410.

Charter, like the ECOSOC and the Trusteeship Council'.⁹¹ As a result, the topic never even reached the agenda of the 2002 Johannesburg Summit.

In summary, the aim of this section has been to bring to attention the growing complexities of the Earth system and the inability of the current international environmental legal regime to tackle the complexities therein. More importantly, this has led me to conclude and justify the need for a structural, unified and consolidated Global Pact to govern the commons. Opening the discussion of such a Pact brings along the need to revive several core structural foundations of IEL, including the concepts of ecological integrity and public trust doctrine to help us navigate the socio-ecological complexities of the era.

4 The Global Pact for the Environment

4.1 The Pact's UN evolutionary process

The idea of a constitutional framework to tackle the environmental crisis is not new.⁹² However, it is indeed the first time that we are proceeding towards this idea with actual scientific evidence that suggests that if human societies do not steer away from critical tipping points in the Earth system, it may potentially lead to rapid and irreversible damage.⁹³ Due to which, the recent past has witnessed a plethora of UN developments including the Rio Summit on Sustainable Development (June 2012),⁹⁴ the adoption of the Paris Agreement (December 2015), the Addis Ababa Action Agenda on Financing for Development (July 2015),⁹⁵ and the 2030 Agenda for Sustainable Development (October 2015)⁹⁶ along with its Sustainable Development Goals (SDGs) (September 2015) to remedy the damages of the Anthropocene

⁹¹ See Peter H. Sand, 'Environmental Summitry and International Law', 13 *Yearbook of International Environmental Law* (2002) 3-15 at 35; and B. H. Desai, *Institutionalizing International Environmental Law* (Transnational Publishers, 2004), ch. 6. On 16 September 2005, the UN General Assembly by Resolution 60/1 ('2005 World Summit Outcome'), para. 176) recommended to wind up the Trusteeship Council, by amending chapters XII and XIII of the Charter; such an amendment will, however, require ratification by two-thirds of the members, including all permanent members of the Security Council.

⁹² See Amedeo Postiglione, 'A More Efficient International Law on the Environment and Setting Up an International Court for the Environment within the United Nations', 20 *Journal of Environmental Policy and Law* (1990) 321-328.

⁹³ See, for instance, Monique Grooten and Rosamunde Almond (eds), *Living Planet Report - 2018: Aiming Higher* (WWF, 2018), available at <https://www.wwf.org.uk/sites/default/files/2018-10/LPR2018_Full%20Report.pdf>; Masson-Delmotte et al (eds), *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, Summary for Policymakers* (IPCC, 2018), available at <https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf> (both visited 5 May 2020).

⁹⁴ The outcome of the major international conference was the 'The Future We Want' document, *supra* note 75.

⁹⁵ 'Addis Ababa Action Agenda of the Third International Conference on Financing for Development (Addis Ababa Action Agenda)', UNGA Res. 69/313 of 27 July 2015), Annex.

⁹⁶ 'Transforming our world: The 2030 Agenda for Sustainable Development', UNGA Res. 70/1 of 25 September 2015.

era. However, the common denominator of all the above international environmental goals is that they were non-legally binding (soft-law).

Owing to the urgency of the situation and faced with lackadaisical attitude of states to collectively tackle global socio-ecological challenges, the Commission Environment of *Club des Juristes*⁹⁷ released a report on ‘strengthening the effectiveness’ of international environmental law in 2015. The report included 21 recommendations, one of which advocated for the need to have a ‘legally binding’ international Environmental Pact.⁹⁸ With the overwhelming support received for the adoption of the Paris Agreement, Laurent Fabius (President of the 21st Conference of the Parties (COP) to the UNFCCC) decided to support the idea and take it to the international level. Between June 2017 and early November 2018, several major steps were taken to support the idea of a Global Pact for the Environment (hereinafter GPE), including many expert gatherings,⁹⁹ a high-level event on the side-lines of the UNGA meeting on 19 September 2017 titled ‘Summit on a Global Pact for Environment’,¹⁰⁰ a Sino-French Summit between France and China in January 2018,¹⁰¹ and, finally, the meeting of the UN General Assembly in which the Enabling Resolution (see below) was adopted.

The principle motivation behind drafting the Pact is to offer a binding international treaty establishing the fundamental principles of environmental law. It is a strong

⁹⁷ A legal think tank based in Paris, see <<http://www.leclubdesjuristes.com/>>. See also Le Club des Juristes, *Increasing the Effectiveness of International Environmental Law. Duties of States, Rights of Individuals* (2015), available at <http://www.fondation-droitcontinental.org/fr/wp-content/uploads/2015/11/CDJ_Rapports_Increasing-the-effectiveness_Nov.2015_UK_web-VDEF.pdf> (visited 5 May 2020).

⁹⁸ See Yann Aguila, ‘La Adopción de un Pacto Internacional para la Protección del Medio Ambiente’, 34 *Revista Aranzadi de Derecho Ambiental* (2016).

⁹⁹ See, for instance, ‘Global Perspectives on a Global Pact for the Environment’, Sabin Center for Climate Change Law blog (20 September 2018), available at <<http://blogs.law.columbia.edu/climate-change/2018/09/20/global-perspectives-on-a-global-pact-for-the-environment/>> (visited 22 July 2020). In addition, many meetings have been held around the world, including in Paris (Conference ‘Towards a Global Pact for the Environment’, La Sorbonne, 24 June 2017), New York (Conference on the Global Pact for the Environment, Columbia University, 20 September 2017), Bogotá (Symposium on the Global Pact for the Environment organized by the Attorney General of the Nation, 1 March 2018), Brasilia (Round Table on the Global Pact for the Environment, World Water Forum, 19 March 2018), Dakar (Conference ‘L’Afrique engage pour la Planète’, 14 May 2018), Geneva (Conference on the Global Pact for the Environment at the UN International Law Commission, 10 July 2018), Santiago de Chile (Coloquio ‘Pactomundial del medioambiente, derechos humanos, y constitución’, 28 August 2018), Québec (Conférence ‘Une opportunité pour un Canada plus vert? Le projet de Pacte mondial pour l’environnement’, 21 September 2018), Ottawa (Le projet onusien de Pacte mondial pour l’environnement : quelles implications pour le Canada?, 24 September 2018), Beijing (Conférences on the legal aspects of a healthy environment, 12 October 2018), Naples (Una patto globale per l’ambiente, 19 October 2018).

¹⁰⁰ See the speech delivered by President Emmanuel Macron during the international launch summit of the ‘Global Pact for the Environment’, which took place during the 72nd UNGA, available at <<https://www.diplomatie.gouv.fr/en/french-foreign-policy/united-nations/events/united-nations-general-assembly-sessions/unga-s-72nd-session/article/speech-by-m-emmanuel-macron-president-of-the-republic-summit-on-the-global-pact>> (visited 29 April 2019).

¹⁰¹ ‘Joint Declaration between the People’s Republic of China and the French Republic’ (10 January 2018), para. 8 (‘China and France intend to continue their constructive dialogue on the formulation of the Global Pact for the Environment’, translation available at <http://www.xinhuanet.com/english/2018-01/11/c_136886038.htm> (visited 5 May 2020).

response to the expectation of the legal community to see the foundations of environmental regulation systemized in a single instrument at an international level.¹⁰² The Pact is presumably expected to fulfill the typical role of constitutions – namely to act as an overarching framework setting forth general binding provisions, while the sector-based details are provided in other instruments such as MEAs.

In May 2018, the process which may ultimately lead to the negotiation of a legally binding Global Pact for the Environment formally commenced under the auspices of UNGA (143 votes in favour, 6 against and 6 abstentions).¹⁰³ Furthermore, the adopted Resolution¹⁰⁴ established an Ad Hoc Open-Ended Working Group (OEWG) to consider the matters and be guided by technical and evidence-based report from the UN Secretary-General (UNSG) on the possible gaps in International Environment Law and environment-related instruments.¹⁰⁵

4.2 Are there gaps or an inherent design problem in IEL?

The UNSG report created quite the stir in the international community, witnessed through the OEWG substantive sessions.¹⁰⁶ It would be unfair to say that, after 40 years of the evolutionary process of IEL, we have failed to learn anything from it.¹⁰⁷ Indeed we have, but is it enough? On one hand, scholars have questioned whether identifying the ‘gaps’ is the right way to proceed.¹⁰⁸ On the other hand, others have pointed out the futility of this exercise and argued that IEL is not incoherent or fragmented; accordingly, it is to be considered a strength and not a deficiency of the

¹⁰² Le Club de Juristes, ‘White Paper: Toward a Global Pact for the Environment’ (2017), available at <<https://wedocs.unep.org/bitstream/handle/20.500.11822/22458/Club%20des%20Juristes%20-%20White-paper-Global-Pact-for-the-environment%20EN.pdf?sequence=9&isAllowed=y>> (visited 5 May 2020).

¹⁰³ The States voting against were Iran, Philippines, Russia Federation, Syria, Turkey and the USA, whilst States abstaining were Belarus, Malaysia, Nicaragua, Nigeria, Saudi Arabia and Tajikistan.

¹⁰⁴ ‘Towards a Global Pact for the Environment’, UNGA Res. 72/277 of 10 May 2018.

¹⁰⁵ ‘Gaps in international environmental law and environment-related instruments: towards a global pact for the environment. Report of the Secretary-General’, UN Doc. A/73/419 (2018), para. 1.

¹⁰⁶ The third and final substantive session of the Ad Hoc Open-ended Working Group (OEWG) established by the UNGA Res. 72/277 (see *supra* note 94) completed its mandate and adopted its recommendations to the UNGA, following its considerations of UNSG report (see *supra* note 104). Despite the goodwill of the majority of delegates, the recommendations adopted by states are a clear retreat from the original proposals of the co-chairs; the states opted for a simple Political Declaration in 2022, in the context of the fiftieth anniversary of the Stockholm Conference. The recommendations constitute: A setback on the date: 2022 (and not 2020-21) and above all, a setback in terms of the ambition: a simple Declaration, the content of which remains vague and not an international, legally binding treaty that enshrines the general principles of environmental law. See further, IISD, ‘Summary of the’, *supra* note 19.

¹⁰⁷ See, for instance, Duncan French and Karen Scott, ‘International Environmental Treaty Law’ in Micheal Bowman and Dino Krtsiotis (eds), *Conceptual and Contextual Perspectives on the Modern Law of Treaties* (Cambridge University Press, 2018) 677-709.

¹⁰⁸ Duncan French and Louis Kotze, ‘Towards a Global Pact for the Environment’: International Environmental Law’s factual, technical and (unmentionable) normative gaps’, 28 *Review of European, Comparative and International Environmental Law* (2019) 25-32.

field that so many different tools and approaches have been employed to address particular problems.¹⁰⁹

The mixed responses to the UNSG report are not surprising; but the role of principles in strengthening environmental protection certainly cannot be ignored.¹¹⁰ Another crucial aspect is that if we design the GPE without incorporating the more recent developments of science,¹¹¹ and, at the same time, open the possibility of future updates and developments of knowledge, it will produce something that is outdated and redundant before it even enters into force.¹¹² In order for the GPE to not fall under the same outdated (and unsuccessful) ways of functioning – we need a new radical starting point to develop IEL and to rectify the inherent design problem – the manner of how we view the ‘environment’.

GPE’s new innovative approach should focus on supporting a legal regime that incorporates scientific aspects of the Earth system. The objects of all the current legal sectorial approaches are deeply inter-connected across the scales of the natural world. The goal of giving coherence and effectiveness to all of these MEAs can be achieved through a strong scientific foundation – thus promoting a harmonized integrated Earth system approach.

The GPE will be the first step of moving forward since it represents conceptual evolution that opens new possibilities of global cooperation and creates the basis for connecting already existing legal documents as well as for building new instruments. In spite of the fact that third substantive session of the OEWG did not turn out as anticipated, there is still room for conversation in the landmark 50th anniversary of the UN Conference on the Human Environment in 2022.

4.3 The Pact’s structural foundation 1: ecological integrity as a Grundnorm

4.3.1 Introduction to ecological integrity

The Pact’s strong substantive structural foundations will set the tone to achieve a high-order normative instrument status that binds states with defined obligations to address the socio-ecological crisis of the Anthropocene.

As I have discussed (in section 2 of this paper), the concept of ‘ecological integrity’ is at the very heart of several MEAs. The notion refers to its roots within the notion

¹⁰⁹ Susan Biniarz, ‘The UNGA Resolution on a “Global Pact for the Environment”. A Chance to Put the Horse before the Cart’, 28 *Review of European, Comparative and International Environmental Law* (2019) 33-39.

¹¹⁰ Christina Voigt, ‘How a “Global Pact for the Environment” Could Add Value to International Environmental Law’, 28 *Review of European, Comparative and International Environmental Law* (2019) 13-20.

¹¹¹ See *supra* section 2.2. These scientific challenges talk about the need for technological interventions to be incorporated – and how they pose as a challenge for law and science.

¹¹² Louise Kotze and Duncan French ‘A Critique of the Global Pact for the Environment: a stillborn initiative or the foundation for Lex Anthropocenae?’, 18 *International Environmental Agreements: Politics, Law and Economics* (2018) 811- 833.

of 'Earth's wholeness' which, in the context of conservation and restoration, for example, suggests that the goal ought to be the creation of the whole, intact systems.¹¹³

James Kay, a systems theorist at the University of Waterloo, proposes that integrity is an all-encompassing term for the various features – resilience, elasticity, stress response, and so on – that allow an ecosystem to adjust to environmental change: 'Integrity should be seen as an umbrella concept that integrates these many different characteristics of an ecosystem, which, when taken together, describe an ecosystem's ability to maintain its organization'.¹¹⁴

The Global Pact requires a clear, workable and valid understanding of ecological integrity that encompasses multiple scales of the Earth system. The most important task for the Pact is to define 'ecological integrity' and observe it as a fundamental non-negotiable condition upon which states shall operate. To begin with, the GPE needs to redefine 'ecological integrity' that is intended to fit the Anthropocene era.

Legal scholars have proposed a reworked definition of ecological integrity: ecological integrity of an area of land (including freshwaters) or sea is the combination of the biodiversity and ecosystem processes (functions) that characterize the area at a given point in time.¹¹⁵ This definition offers the Pact an opportunity to treat the Earth system functions as a single integrated whole.

4.3.2 Earth Charter as a signpost for the Pact

The Global Pact is intended to inculcate a holistic form of governance model that is global and all-inclusive in nature. This model of a truly globalized governance structure is best found in the Earth Charter. The Earth Charter is a document with sixteen principles that power a global movement towards a more just, sustainable and peaceful world.¹¹⁶ The draft GPE embeds ecological integrity in Articles 2 and 18. On one hand, Article 2 provides for states, institutions and individuals to take care of the environment in a way that everyone would contribute 'to the conservation, protection and restoration of the integrity of Earth's ecosystems. Article 18, on the other hand, requests actors to cooperate in order to conserve, protect and restore the integrity of Earth's ecosystems and community of life. The community of life is the other key concept of the Earth Charter. It appears in the Preamble and is at the

¹¹³ Geoffrey Garver, 'Ecological Integrity in the Anthropocene: Lessons for Law from Ecological Restoration and Beyond' in Westra et al (eds), *The Role of Integrity*, *supra* note 41, 191-197.

¹¹⁴ James J. Kay, 'A Non-Equilibrium Thermodynamic Framework for Discussing Ecosystem Integrity', 15(4) *Environment Management* (1991) 483- 495.

¹¹⁵ See Peter Bridgewater, Rakhyun E. Kim and Klaus Bosselmann, 'Ecological Integrity: A Relevant Concept for International Environmental Law in the Anthropocene?', 25(1) *Yearbook of International Environmental Law* (2015) 61-72.

¹¹⁶ See further Earth Charter, <<https://earthcharter.org/>>.

core of the ethical proposals of the Charter, in its Pillar I – Respect and Care for the Community of Life.¹¹⁷

Hence, the Earth Charter offers a significant approach as a step forward for the Global Pact because the document proposes a set of principles on ecological integrity before other principles, which reflects the necessity to develop within the natural limits and understand the conditions of the environment. Furthermore, the Earth Charter not only defines pillars, but also organizes them in a particular way. A very important feature it has is that it emphasizes the inter-dependence of environmental, social and economic challenges. This should be a guiding beacon for the GPE.¹¹⁸ The Pact shall also derive morality of a new governance structure as spelled out in the Earth Charter's preamble. It is imperative that 'we, the people of Earth, declare our responsibility to one another, to the greater community of life, and to future generations'.¹¹⁹ It states the need for taking responsibility to one another as 'imperative'. The Preamble's notion of universal responsibility is reflective of the principle of sustainability¹²⁰ and cannot be confused with shallow versions of sustainable development.

4.3.3 Accommodate temporal unevenness and inclusion of 'uncertainty'

The Global Pact is intended to be a legally binding document that codifies international environmental legal principles; in other words, hard law. However, the Pact needs to accommodate temporal unevenness and uncertainty. The gap between law and science needs to be bridged by the Pact. The relationship between law and science has often been described as an 'uneasy' one. The purpose of science is to seek the truth, while the purpose of law is to seek justice or at least reasonable and fair resolution to disputes. Law's primary purpose is to resolve human disputes rather than to continually add to a body of testable knowledge.¹²¹ This brings us to one of the biggest challenges of the legal system – to be able to address the uncertainty inherent in science, which may result in a lack of data, inconsistent data, or conflicts in the interpretation of data.¹²² Many gaps and uncertainties exist in the scientific information relied upon to make environmental policy decisions.¹²³

¹¹⁷ Maksim Lavrik, Alicia Jimenez and Mirian Vilela, 'The Global Pact for the Environment: As a Next Step on the Way Forward for the Earth Charter' (Earth Charter International Secretariat, 2018), available at <<https://earthcharter.org/wp-content/uploads/2020/02/Global-Pact-and-Earth-Charter-2018-2-3.pdf>> (visited 25 June 2019).

¹¹⁸ Klaus Bosselmann, 'Outlook: The Earth Charter – a Model Constitution for the World?' in Klaus Bosselmann and J. Ronald Engel (eds), *The Earth Charter: A Framework for Global Governance* (Kit, 2010) 239-255.

¹¹⁹ The Earth Charter at 1.

¹²⁰ Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Ashgate, 2008).

¹²¹ Mary Jane Angelo, 'Harnessing the Power of Science in Environmental Law: Why we should, Why we don't and How we can', 86 *Texas Law Review* (2008) 1527-1530.

¹²² *Ibid.* at 1531.

¹²³ Wendy E. Wagner, 'Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment', 53 *Duke Law Journal* (2004) 1619-1633 (describing the lack of scientific research and data on environmental problems).

Therefore, the main contentions of this section are to place ecological integrity into our way of thinking about the environment. If the Global Pact is devoted to the ‘global environment’ with the aim of addressing gaps and to provide coherence and effectiveness through a structurally coherent scientific theoretical framework, the only consistent approach is through the best available scientific knowledge of the Earth system functioning – the planetary boundaries. These science-based limits of key processes determine the Earth system functioning. The Global Pact’s best bet for success is through treating the Earth system functions as a single integrated system at the planetary level.¹²⁴ Therefore, approaching the Earth system in an integrated way will be the best step moving forward, since it represents a conceptual evolution that opens new possibilities for global cooperation and creates a basis for connecting already existing legal documents as well as for building new instruments.

4.3.4 Ecological sustainability

When we are discussing the need to ‘stay within the planetary boundaries’, it becomes imperative for the Global Pact to define ‘ecological sustainability’ in the light of focusing on natural biological processes and the continued productivity and functioning of ecosystems. In the broadest sense of global sustainability, it should include all components of biosphere. The planetary boundaries framework is one of the most significant recent attempts to recognize ecological constraints on what we can do with Earth’s resources. It offers a systematic approach to defining ‘safe operating space for humanity’, a zone of wellbeing and resilience in relation to a set of ecological conditions. The key idea is that by keeping human activities from breaching the planetary boundaries, we can maintain the Earth more or less in the conditions that have enabled humanity to evolve over the millennia since the Ice Age.¹²⁵

The Earth Charter’s mission is to shine light on international cooperation towards ‘sustainability’. The success of the Global Pact depends on its closeness to the reflection of the Earth Charter. The Global Pact should interlink with the principles and values of the Earth Charter. The Earth Charter calls to ‘join together to bring forth a sustainable global society’¹²⁶ and the Global Pact stresses ‘the need to adopt a common position and principles that will inspire and guide the efforts of all to protect and preserve the environment’.¹²⁷

¹²⁴ See further, Klaus Bosselmann, ‘Shifting the Legal Paradigm: Earth-centred law and governance’ in Paolo Magalhaes et al (eds), *The Safe Operating Space Treaty. A New Approach to Managing Our Use of the Earth System* (Cambridge Scholars Publishing, 2016) 64-82.

¹²⁵ Ian Christie, Jacquetta Lee and Richard J. Murphy, ‘Operationalizing “absolute sustainability” in relation to natural capital’ (Centre for Environmental Strategy (CES), University of Surrey, 2016), available at <https://naturalcapitalcoalition.org/wp-content/uploads/2016/07/University-of-Surrey-Nat-Capital-paper_final_logo.pdf> (visited 7 May 2020), 1-4; See further, Will Steffen et al, ‘Planetary boundaries: Guiding human development on a changing planet’, 347(6223) *Science* (2015) 736-744.

¹²⁶ Preamble.

¹²⁷ Lavrik et al, ‘The Global Pact’, *supra* note 104, at 4.

4.3.5 Rethinking and operationalizing ‘sustainable development’ under the Global Pact

The idea of sustainability articulated by the Brundtland report (the World Commission on Environment and Development, WCED)¹²⁸ and others highlight the need for development, sustainability and equity – a formulation broad enough to make it attractive to groups with many different perspectives. Sustainable Development, as defined by the WCED, is paradoxical as ‘it aims at reconciling the right of development of every world citizen with global environmental burdens associated with the current development model’.¹²⁹ The contradiction in terms of reconciling sustainability and development would be impractical.¹³⁰ It should be remembered that, in the concept of sustainable development, ‘sustainability’ is what conditions ‘development’, not vice versa.¹³¹

This implies the need to delve deeper into the authentic meaning of sustainability. The idea of sustainability has deep roots in all cultures of the world.¹³² The term itself, however, was shaped in the seventeenth-century European discourse on timber shortage. Initiated by the Royal Society and its founding member John Evelyn, paved the way to a new approach to the management of forests.

In Germany, for instance, it led to the coining of the new term *Nachhaltigkeit* (sustainability). Its first legislative use dates back to 1713 and was enacted by Hans Carl von Carlowitz, the head of the Royal Mining Office in the Kingdom of Saxony, in the context of meeting the challenge of a predicted shortage of timber.¹³³ The principle of sustainability was fundamental in forest legislation of the nineteenth century; for instance, Article 2 of the Bavarian Forest Law of 1852 reads: ‘The management of state owned forests has to follow sustainability as its highest principle’.¹³⁴

The historical sources shed new light on the essence of the modern composite term ‘sustainable development’, which is often diluted and distorted. The fact that sustainability was early on a legal term with a defined content and was used in legislation is important for the interpretation of sustainable development. It would be wrong to assume that this construct only emerged following the Brundtland report

¹²⁸ Gro Harlem Brundtland: *Our Common Future* (Oxford University Press, 1987).

¹²⁹ Bart Muys, ‘Sustainable Development within Planetary Boundaries: A Functional Revision of the Definition Based on the Thermodynamics of Complex Social-Ecological Systems’, 1 *Challenges in Sustainability* (2013) 41-52.

¹³⁰ Jacobus A. Du Pisani, ‘Sustainable Development – Historical Roots of the Concept’, 3 *Environmental Sciences* (2006) 83-96.

¹³¹ Bosselmann, *The Principle of, supra* note 107, at 53.

¹³² Desta Mebratu, ‘Sustainability and Sustainable Development: Historical and Conceptual Review’, 18 *Environmental Impact Assessment Review* (1998) 493- 520; Christopher G. Weeramantry, *Universalising International Law* (Martinus Nijhoff Publishers, 2004); Ulrich Grober, *Deep Roots – A Conceptual History of ‘Sustainable Development’ (Nachhaltigkeit)* (Social Science Research Center Berlin, 2007).

¹³³ Bosselmann, *The Principle of, supra* note 107, at 17–22.

¹³⁴ *Ibid.* at 21.

and could only be interpreted accordingly. We need to revise the concept of sustainable development in light of historical usage and refocus on its core meaning as ‘not risking the substance’.¹³⁵

With this in backdrop, centring the discussion back to the Global Pact, ‘sustainability’ should be the end goal and a broad term, when understood as an integration opportunity. The Global Pact should serve as a binding legal instrument that not only defines the planetary boundaries parameters, but also enables integration efforts in the context of a systematic approach to operationalizing a vision, shared understanding, baseline assessment and an action-oriented approach to prioritizing next steps.¹³⁶ Moving forward, the Global Pact will need to utilize a ‘baseline set of questions and provisional indicators’ concerning planetary boundaries that will enable future MEAs to align efforts with targets for achieving optimal sustainable levels that are based on best available ecological science.¹³⁷

4.4 The Pact’s structural foundation 2: an Earth system approach to the Global Pact

‘Earth system’ refers to the ‘global environment as an integrated whole’.¹³⁸ The Earth system is a single whole, integrated system indivisible and cannot be segmented conceptually, materially or through any other legal abstraction into discrete part.¹³⁹ Therefore, it must be considered our ultimate common goal because it unites us all. Keeping in line with the Global Pact’s overall principal aim of acting as an overarching framework that unites under one legal umbrella, it is only logical for the Pact to adopt an Earth system’s approach.

A favourable Earth system state is identifiable through the planetary boundaries framework, which defines nine critical Earth system processes (for instance, climate change, ozone depletion, biosphere, integrity and others) whose effective management is the key to the maintenance of a resilient and accommodating state of the planet. The whole collection of these nine processes and their interactions, as well as the maintenance within scientifically defined boundaries, is what is defined as the ‘Safe Operating Space for Humanity’.¹⁴⁰

¹³⁵ See Klaus Bosselmann, ‘Losing the Forest for the Trees: Environmental Reductionism in the Law’ 2 *Sustainability* (2010) 2424–2436.

¹³⁶ Robert Sroufe, ‘Operationalising Sustainability’, 1(1) *Journal of Sustainability Studies* (2016) 1–12.

¹³⁷ Christie et al, ‘Operationalizing “absolute sustainability”, *supra* note 112, at 4.

¹³⁸ Clive Hamilton, ‘Define the Anthropocene in terms of the whole Earth’, 536(7616) *Nature* (2016) 251; Will Steffan et al, ‘The Emergence and Evolution of Earth System Science’, 1 *Nature Reviews Earth & Environment* (2020) 54–63.

¹³⁹ Paulo Magalhães et al, ‘Why do we need an Earth System Approach to guide the Global Pact for Environment’ (Common Home of Humanity, 2019) available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/27702/earth_pact.pdf?sequence=1&isAllowed=y> (visited 10 May 2020) at 3–15.

¹⁴⁰ Georgina M. Mace et al, ‘Approaches to defining a planetary boundary for biodiversity’, 28 *Global Environmental Change* (2014) 289–297; Johan Rockstrom et al, ‘Planetary Boundaries: Exploring the Safe Operating Space for Humanity’, 14(2) *Ecology and Society* (2009) 1–33; Steven J. Lade, ‘Human impacts on planetary boundaries amplified Earth System interactions’, 3 *Nature Sustainability* (2020) 119–128.

4.4.1 Defining ‘environment’ by relinquishing duality

The draft Pact needs to clearly define ‘the environment’. As I have emphasized earlier, when we consider the wholeness of the Earth, the idea of environment through the lens of the GPE needs to relinquish the ‘illusion’ of control over nature. The inherent design problem in IEL and all MEAs lies in the way they have viewed the environment. The Global Pact requires a radical outlook that shuns dualisms of sorts by changing the perspective from ‘us *versus* nature’ towards ‘we *are* nature’.¹⁴¹

In the Hindu philosophy, this is referred to as ‘*Advaita*’, literally meaning ‘no-two’s’. An emphasis on opposing categories such as the material world versus the spiritual, good versus evil, the arts versus the sciences, the economy versus the environment, and individuality versus the community and humans versus nature are examples of duality.¹⁴²

Environmental law has developed on a very specific set of Western cultural ideas about human/nature relationship. Any new international environmental instrument, such as the Global Pact, should be required to operate upon a definition of ‘environment’ that shuns all forms of dualisms and takes a revolutionary approach that focuses on the ecological context of human activities.¹⁴³

4.4.2 Defining ‘safe operating space for humanity’ for future legal instruments

Owing to the growing understanding of the Earth system and the recent possibility of measuring its state through the definition of planetary boundaries, we now have a scientific basis upon which to define the ‘safe operating space’ of the Earth system.¹⁴⁴

With the ability to quantify and define a desirable state of the Earth system, we have made a giant step to solve the legal vacuum created by indeterminate and vague concepts. The Global Pact needs to utilize this opportunity to define a safe operating space within which humanity can operate and to ensure that all future international environmental legal instruments are operating in the realm of the safe space.

¹⁴¹ See Andreas Philippopoulos-Mihalopoulos, ‘...the Sound of a Breaking String: Critical Environmental Law and Ontological Vulnerability’, 2(1) *Journal of Human Rights and the Environment* (2011) 5-22; Anna Grear, ‘Foregrounding vulnerability: materiality’s porous affectability as a methodological platform’ in Andreas Philippopoulos-Mihalopoulos and Victoria Brooks (eds), *Research Methods in Environmental Law. A Handbook* (Edward Elgar, 2017) 3-28; See further, Klaus Bosselmann, ‘A Vulnerable Environment. Contextualising Law with Sustainability’, 2(1) *Journal of Human Rights and the Environment* (2011) 45-63.

¹⁴² Bosselmann, ‘Losing the Forest’, *supra* note 121, at 2425.

¹⁴³ Klaus Bosselmann, ‘The Way Forward: Governance for Ecological Integrity’ in Laura Westra, Klaus Bosselmann, and Richard Westra (eds), *Reconciling Human Existence and Ecological Integrity* (Earthscan, 2018) 319-323.

¹⁴⁴ Rockstrom et al, ‘Planetary Boundaries: Exploring’, *supra* note 30.

Planetary boundaries define a ‘safe operating space’ for humanity based on evolving understandings of the functioning and resilience of the planet.¹⁴⁵ This will be a giant step for IEL that coordinates the law – science interface that will control human activities and hold us back from pushing planetary boundaries.

The Global Pact should strive to be a legal model for the Anthropocene. A model that requires regulation for ensuring the protection and promotion of common interests through the construction of a new governance structure that represents the interests of all humankind, both in present and the future.

4.4.3 Earth system law to govern the Global Pact?

With the focus of Earth system governance on human-social aspects of planetary changes, law has played a peripheral part in its governance. To this end, while there is a clear link between Earth system governance and the law, it is unclear how law could respond from a regulatory perspective to some of the key problem characteristics of Earth system governance. These include, among others, the level of persistent uncertainty that characterizes anthropogenic Earth system transformation; the functional inter-generational dependencies created by the Earth system transformation; the functional inter-dependence of Earth system elements such as climatic and aquatic systems; new and multiple forms and degrees of global spatial human and non-human interactions and inter-dependencies.

So, it can be argued that an Earth system law can and should develop simultaneously. First, the analytical dimension of Earth system law that understands the science of law i.e. the structure, content, processes and institutions of legal systems, is necessary. Second, Earth system law should explore and address normative considerations of Earth system governance. Third, the analytical and normative dimensions lead to prescriptive questions about how to achieve a desirable future. Rethinking and reforming law and its role in Earth system governance will be instrumental in contributing to the regulatory response urgently required to enable humanity to mitigate the Anthropocene’s impacts, to adapt to a drastically changed socio-ecological reality, and to increase resilience.¹⁴⁶

At this stage, it is not an unimaginable stretch to justify the need for a global Earth system law that could potentially govern the Pact and its governance structures. The idea of such a law is still new, but its requirement is now more than ever as we are

¹⁴⁵ See further, Klaus Bosselmann and Kristen Jones, ‘The Planetary Integrity Project: Creating a Safe Operating Space through Law and Governance’ (New Zealand Centre for Environmental Law, 2016), available at <<http://planetaryboundariesinitiative.org/wp-content/uploads/2016/10/PIP-Report-Sept-2016.pdf>> (visited 10 May 2020), 4-25.

¹⁴⁶ Louis J. Kotze and Rakhyun E. Kim, ‘Earth System Law: Juridical Dimensions of Earth System Governance’, 1 *Earth System Governance Journal* (2019) 1-12. See also Task Force on Earth System Law, available at <<http://www.earthsystemgovernance.org/research/taskforce-on-earth-system-law/>>.

anticipating heading towards the Anthropocene era and it will reverse the traditional rule –that international law ends where national borders begin.¹⁴⁷

4.5 Structural foundation 3: Earth trusteeship for Global Pact's regulatory response

The sovereign rights of nation states to govern the common pool of natural resources are not proprietary, but fiduciary. The idea of environmental trusteeship is not new.¹⁴⁸ If we define it in simple terms, it means that certain natural resources – e.g. water-courses, wildlife, or wilderness areas – regardless of their allocation to public or private uses, are part of an 'inalienable public trust'. Certain authorities – for instance, federal agencies, state governments, or indigenous tribal institutions – are designated as 'public trustees' for the protection of those resources and every citizen, as a 'beneficiary' of the trust, may invoke its terms to hold the trustees accountable and to obtain judicial protection against encroachments or deterioration of the public trust.

Now, the last question that needs particular attention is whether there is a need for a new institution as a steward for global ecological integrity? The Earth trusteeship principles¹⁴⁹ constitute an innovative foundation for multi-stakeholder collaboration towards governance of natural resources 'for the common good'. The Earth trusteeship principles at play are to be guided by dynamic exchanges between science and indigenous world views, as well as modern social innovation management.

This is to result in cross-cultural joint efforts to achieve eco-system restoration, biodiversity recovery and related transformation of lifestyles. Primarily by means of regenerative agriculture and landscaping and sustainable food system governance based on inspired citizen's participation.¹⁵⁰

4.5.1 Conceptual origins of Earth trusteeship

The conceptual origins of Earth Trusteeship can be located in the lifetime mission of Judge C.G Weeramantry (1926-2017), former Vice President of the International

¹⁴⁷ Klaus Bosselmann, 'Large-Scale Acquisitions of the Commons: The Need for Earth Governance' in Bosselmann et al (eds), *Ecological Integrity and, supra* note 40, at 1-13.

¹⁴⁸ Peter H. Sand, 'Sovereignty Bounded: Public Trusteeship for Common Pool Resources?', 4(1) *Global Environmental Politics* (2004) 47-71.

¹⁴⁹ Appeal 'Hague Principles for a Universal Declaration on Responsibilities for Human Rights and Earth Trusteeship' in the design process of the 'Ad Hoc Open Ended Working Group towards a Global Pact for the Environment (OEWG)' and its follow-up, School for Wellbeing, Studies and Research <https://wedocs.unep.org/bitstream/handle/20.500.11822/27976/ETI_proposal.pdf?sequence=1&isAllowed=y#:~:text=Principle%201%20Responsibilities%20for%20Earth&text=Each%20state%20individually%2C%20and%20the,integrity%20of%20Earth's%20ecological%20systems> (visited 23 July 2020).

¹⁵⁰ Appeal to include dialogue on The Hague Principles for a Universal Declaration on Responsibilities for Human Rights and Earth Trusteeship in the design of the 'Ad Hoc Open-Ended Working Group towards global Pact for the Environment (OEWG)', available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/27976/ETI_proposal.pdf?sequence=1&isAllowed=y> (visited 23 July 2020).

Court of Justice. He stated: 'Humanity is in a position of trusteeship of the environment and not in the position of dominance'.¹⁵¹ In the observation of Judge Weeramantry, the concept of trusteeship is, as a living example, rooted in traditional irrigation systems and practices of farmers in Sri Lanka, his home country. Trusteeship resonates with the world views of indigenous peoples and the teachings of world religions as well as with nature-based secular philosophies.

The ethics of Earth stewardship are an integral part of the world's religions and indeed humanity's cultural heritage, but these ethics have never been more topical than today. Earth trusteeship is the essence of what Earth jurisprudence is advocating, but, more importantly, it has also been called for in key MEAs. Earth trusteeship is the institutionalization of the fundamental duty to protect the integrity of Earth's ecological systems. For instance, this duty resonates in more than 25 international agreements – from the 1982 World Charter for Nature through to the 2015 Paris Climate Agreement.¹⁵²

The legitimacy of the state as a legal institution rests on its ability to care for its citizens. To this end, state has fiduciary obligations and fundamental acts, in fact, as a trustee for its citizens and their cultural and natural commons.¹⁵³ Although the concepts of 'sovereignty as responsibility' and 'responsibility to protect' have been

¹⁵¹ Chris G. Weeramantry, *Tread Lightly on the Earth. Religion, The Environment and the Human Future* (World Future Council, 2014), available at <<https://trove.nla.gov.au/work/36404571?q&version-Id=46875824>> (visited 23 July 2020).

¹⁵² Rakhyun E. Kim and Klaus Bosselmann, 'Operationalizing Sustainable Development: Ecological Integrity as a Grundnorm in International Law', 24(2) *Review of European, Comparative and International Environmental Law* (2015) 194-208; Klaus Bosselmann, 'The Next Step: Earth Trusteeship', Seventh Interactive Dialogue of the United Nations General Assembly on Harmony with Nature, New York, 21 April 2017, available at <<http://files.harmonywithnatureun.org/uploads/upload96.pdf>> (visited 11 May 2020).

¹⁵³ Recent legal analysis on the concept of Earth trusteeship include Klaus Bosselmann, *Earth Governance: Trusteeship of the Global Commons* (Edward Elgar, 2015); Peter Burdon, *Earth Jurisprudence: Private Property and the Environment* (Routledge, 2015); Polly Higgins, *Eradicating Ecocide: Laws and Governance to Prevent the Destruction of our Earth* (2nd ed., Shephard-Walwyn, 2015); Burns Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights and the Law of the Commons* (Cambridge University Press, 2014); Mary C. Wood, *Nature's Trust: Environmental Law for a New Ecological Age* (Carolina University Press, 2013).

recognized by states,¹⁵⁴ most states strongly resist the expansion of such responsibilities even to cases of natural disasters.¹⁵⁵

Re-centring the discussion towards the Global Pact, an international instrument that carries within it the power and legitimacy to act as an umbrella framework that will put checks and balances on human activities from pushing the planetary boundaries. The strain of thoughts, reflections on law, spiritual insights, traditional farmer's practices and indigenous world views lead to the simple maxim: 'All global citizens are equal trustees for the benefit of future generations'.¹⁵⁶

4.5.2 Operationalizing Earth trusteeship under the Global Pact

The Earth trusteeship inspired research should focus on gathering evidence-based assessment, analysis and reflection on governance challenges, as well as actual solutions, enabled by the Earth trusteeship approach.¹⁵⁷

The Earth trusteeship principles¹⁵⁸ can constitute enabling legal and governance conditions for multi-stakeholder environmental recovery at local and regional levels, thereby offering the Global Pact with a new foundation and methodologies for related capacity-building.¹⁵⁹

It is crucial to note that adopting Earth trusteeship principles into the contemporary international law will not be 'new design' but rather should be viewed as a much needed timely synthesis of existing legislation and timeless, globally shared, intrinsic values. This synthesis crafting process in the Global Pact could ultimately result in the articulation of Earth trusteeship as an essential dimension of the overarching principles constituting the evolving structure of the Pact.

¹⁵⁴ On the responsibility to protect, see 'The Responsibility to Protect', the report of the International Commission on Intervention and State Sovereignty (2001), available at <<http://responsibilitytoprotect.org>>. ('The concept of sovereignty as responsibility' now must extend to the responsibility of the state to protect its citizens.); 'In Larger Freedom: Toward Development, Security and Human Rights for All: Report of the Secretary-General', UN Doc. A/59/2005 (2005) para. 135 and Annex ('[T]he responsibility to protect... lies, first and foremost, with each individual State, whose primary *raison d'être* and duty is to protect its population. But if national authorities are unable or unwilling to protect their citizens, then the responsibility shifts to the international community...'). Various grounds have been invoked for this principle, including *jus cogens* and *erga omnes* obligations. See Jutta Brunnée and Stephen J. Toope, 'The Responsibility to Protect and the Use of Force: Building Legality?' 2(3) *Global Responsibility to Protect* (2010) 191-212 at 206-07; Hannah Yiu, "Jus Cogens," the Veto and the Responsibility to Protect: A New Perspective', 7 *New Zealand Yearbook of International Law* (2009) 207-254 at 232.

¹⁵⁵ See Eyal Benvenisti, 'Sovereigns as Trustees of Humanity: On the Accountability of States to Foreign Stakeholders', 107 *American Journal of International Law* (2013) 295-333.

¹⁵⁶ 'The Hague Principles for a Universal Declaration on Responsibilities for Human Rights and Earth Trusteeship', available at <<http://www.earthtrusteeship.world/>>.

¹⁵⁷ *Ibid.* at 4.

¹⁵⁸ *Ibid.* at 13.

¹⁵⁹ *Ibid.* at 12.

In this paper, the Earth Trusteeship is proposed to be taken into consideration as an overarching principle (among others) of IEL. It resonates with almost 12 dimensions of the Global Pact for the Environment such as the integration of rights and duties within a normative approach (benefitting others, 'the common good'); Articles 9-11 the draft Pact contain the three pillars of environmental democracy – access to information, public participation and access to justice in environmental matters; and it addresses the reduction of inequality, and strengthens global citizenship and the intentional evolution of environmental awareness. Further, articulation of Earth trusteeship in the framework of a critical but supportive, civil society-driven dialogue will benefit the Global Pact for Environment process. It will enable the integration of civil society sectors and cultural values that are not currently included into the stricter secular foundation of the Pact.

Finally, Earth trusteeship intends to give voice to indigenous people's wisdom, world religions on the obligation to care, engaged spirituality, traditional and organic farmer values, the interests of future generations and nature. Since Earth trusteeship is rooted in a great diversity of consensus-building world views, its integration and synthesis into the structural foundation of the Global Pact will enable the Pact to gain a holistic, integrated, umbrella framework status to protect the Earth and all its residents.

5 Conclusion

The relationship of humans with the environment has changed throughout the evolution of Homo sapiens and the development of societies. For virtually all human existence on Earth, interaction with the environment has taken place at the local, regional, and global change. The emerging discourse of the Anthropocene requires us to treat the Earth system as a complex adaptive system and to steer away from interacting planetary tipping points. Such an analytical approach has wide implications for managing the challenges that characterize the Anthropocene.

The much-needed Global Pact for the Environment will be required to act as a framework that has the ability to keep human activities within the planetary boundaries and have significant impact on the resilience of populations of all species, not just humans, on Earth. Detailed research needs to be conducted into the issue of governance of socio-ecological systems with a special emphasis on resilience. The work being done emphasises the need to be aware of the environmental limits that determine the physical and biological boundaries of Earth systems, which will affect the activities that people are able to undertake. An emerging idea is to incorporate an awareness of the planetary boundaries into policy and decision-making processes at all levels of government.

The Global Pact needs to be used as a mechanism by which activities can be measured against the likely impact they have on the planetary boundaries. The very core of this research is to provoke the thought for the need to adopt an Earth system approach for the Global Pact wherein the entire Earth's wholeness is taken into consideration. The Pact needs to be a legal framework protecting the Earth's wholeness. At this point it becomes imperative to clarify that the Global Pact is not in 'competition' with MEAs; its original intention is to give structure and coherence to IEL and this is possible when 'ecological integrity' lies at the heart of the Pact's structural framework.

I do believe the Pact has the capability to unify humanity to protect the Earth's wholeness only if we see ourselves as stewards of the Earth, wherein states act as trustees of the common good, thereby taking a crucial step towards Earth governance.