

Position Paper for the Planetary Civics Inquiry: A New Framework for Planetary Futures

Governing our entangled tomorrows in an age of long
emergencies

Introduction

The Covid-19 pandemic acted as a shot across the bows of our planetary consciousness revealing the extent of the interdependence between cascading risks and innumerable points of systemic fracture. We are in a particular 'age of emergence' where technological advancement has come at a moment in time when human and environmental systems have eroded and, in some cases, risk complete collapse. As set out in *A Way Forward*, an exploration by [Dark Matter Labs \("Dm"\)](#) and the United Nations Development Programme (UNDP), the level of interconnected and

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cascading risks and uncertainty gives rise to unknowable shocks while “our collective will, technical capacity, and statecraft to tackle them appear to be lacking”¹.

However, humanity is far from a passive onlooker waiting for the impending disaster or a calamity of the unknowns. We need to understand our role as but one species on this Earth and our role in caring for it and for each other. Moreover, we create the very knowledge systems (economic and political systems, technologies, and modes of production) that generate systemic risk. In his book, *Novacene: The Coming Age of Hyperintelligence*, the scientist and environmentalist, James Lovelock, states that “We alone, among all the species that have benefitted from the flood of energy from the Sun, are the ones who evolved with the ability to transmute the flood of photons into bits of information gathered in a way that empowers evolution. Our reward is the opportunity to understand something of the universe and ourselves”. Rather than fear technological advancements, we can embrace them as a tool to tackle some of the most complex planetary challenges. We can build alliances and research partnerships to work on collective sense-making, the exchange of information and ideas, experimentation, radical new politics and institutions, new governance and relational frameworks, and new communications methods and tools.

The Planetary Civics Inquiry (the “Inquiry”) is a collaboration between founding members²: Dm; [RMIT University](#) (“RMIT”)³; the [Center for Complexity](#) at the [Rhode Island School of Design](#) (“RISD”); and [Politics for Tomorrow](#) (with discussions underway with other potential members). The Inquiry aims to:

- ◆ Seed a multi-disciplinary research partnership;
- ◆ Publish a series of planetary papers to support a forward trajectory in terms of planetary-scale thinking;
- ◆ Convene a series of high-level closed room convening and open forum convening to deepen understanding of planetary civics and to bring together the ecosystems of actors working in this space;

¹ See *A Way Forward: Governing in an Age of Emergence*, a collaboration between Dark Matter and the United Nations Development Programme, Chapter 4: The Age of Emergence - <https://awayforward.undp.org/Chapter-4-The-Age-of-Emergence>

² We are in discussions with a few other potential members (with a view to be confirmed before the publication of this paper)

³ The Inquiry was soft launched by Dm and RMIT in August 2023 at the *Wild Hope: Conversations for a Planetary Commons* exhibition and public programme, part of the City of Melbourne’s *Now or Never* festival. A press release can be found at <https://www.rmit.edu.au/news/all-news/2023/aug/planetary-civics-initiative>.

For further information please refer to: <https://designhub.rmit.edu.au/exhibitions-programs/wild-hope-conversations-for-a-planetary-commons>.

- ◆ Curate a series of experiments to build tangible, real world proof cases of potential planetary scale infrastructure around the world;
- ◆ Publish a series of research papers for key next generation capabilities design;
- ◆ Build Praxis Practitioner Networks to support the learning of practitioners on the ground across geographies;
- ◆ Establish a series of research design studios and laboratories focused on the renewal, governance and interface between planetary-scale "hyperobjects";
- ◆ Create the foundation for a new pedagogic pathway for the nurturing of next generation disciplines and practitioners in an age of emergence.

The Inquiry is a systemic provocation and does not represent a positionality as such. This Position Paper has been published on the Inquiry [website] for peer review. We hope that it acts as a leitmotif to help build a framework for the governance of planetary futures and that the ideas that are set out can spur dialogue, add to an indispensable process of co-production, and help build a research partnership inclusive of those interested in the scope of this work. The Inquiry will provide directionality on the governance of and the interface between hyperobjects and human and non-humans to enable the articulation and shared sense-making between actants and potentially different forms of sovereignty.

One of our first aims is to build a multi-disciplinary research partnership. We believe that deep collaboration is required for the nature of this exploration. We feel that the coming together of committed voices will provide a sense of the expansive possibilities space, provide positive momentum, and unlock and advance nascent concepts and experimentation. We also believe that humankind is at a critical juncture. Firstly, there is an awakening of planetary consciousness regarding the scale of planetary challenges. Groups of stakeholders have recognised that there is finite time to correct destructive pathways and have begun to experiment and generate new propositions. Secondly, in computational advancements we may finally have the tools to match the scale of planetary challenges and build bold, ambitious models of care to repair and sustain our planet which can provide new insights and ways of thinking, being, learning and self-learning.

It is important to note at the outset that the use of planetary systems in this Position Paper is explicit. The language of 'planetary' is to be distinguished from 'global' systems, which are an extension of the

nation-state and which define the world in terms of territory, or ethnocentric and historic lines. As Prateek Shankar maintains in *No One Lives on the Globe*, an essay produced by the Center for Complexity at RISD, globalism relies on “human-centric perspectives that often fail to account for the agency and autonomy of non-human entities”⁴. Planetary systems, on the other hand, involve not only state level-interactions but also socio-ecological systems and processes.

As the philosopher of technology Benjamin Bratton has said, a planet is “what makes worlds possible”, as worlds emerge from a “planetary condition that precedes them, that exceeds them, and that gives them form”⁵. Moreover, the concept of planetarity, developed by cultural theorist Gayatri Spivak, invokes a relationship between the human and the natural world that is beyond capitalist globalisation:

The planet is in the species of alterity, belonging to another system; and yet we inhabit it, on loan...If we imagine ourselves as planetary creatures rather than global entities, alterity remains underived from us; it is not our dialectical negation, it contains us as much as it flings us away⁶.

To embrace the concept of planetarity is to acknowledge human coexistence with other species on Earth.

Spivak motivates us to sit with and confront uncertainty. As Shankar notes: “To her, planetarity is a gesture of protest, a sceptical rejection of models that attempt to flatten all people, living beings, and ecosystems within a totalizing organisational logic. It challenges the very idea of understanding the Earth, suggesting instead that our relationship with the planet be characterised by unknowability”⁷. We embark, then, not just on a path of new forms of governance, but on a journey of new ways of relating to each other, to other species and to hyperobjects themselves. Shankar challenges us to look beyond what we know and to embrace uncertainty:

As we find ourselves at this crucial juncture in our shared history, where every day is an ALL CAPS headline announcing yet another lethal calamity somewhere in the world, this negotiation of how we choose to relate to the world becomes crucial, especially if we are to ever build pathways towards mutual flourishing⁸.

⁴ Shankar P., *No-one lives on the globe*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/No-One-Lives-on-the-Globe>.

⁵ Bratton B., *New World Order for Planetary Governance*, Strelka Mag (May 27, 2021) - <https://strelkamag.com/en/article/new-world-order-for-planetary-governance>.

⁶ Majumder A., *Gayatri Spivak, Planetarity and the Labor of Imagining Internationalism*, Mediations, Volume 30, No. 2: Post-Humanisms Reconsidered - <https://mediationsjournal.org/articles/planetarity#:~:text=Planetarity%2C%20Spivak%20writes%2C%20invokes%20a,neat%20contrast%20with%20the%20globe>

⁷ Shankar P., *No-one lives on the globe*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/No-One-Lives-on-the-Globe>.

⁸ Ibid.



Limitations of Traditional Global Governance Models

Failure in an Age of Complexity and Fracture

The scope of planetary-scale challenges, and the level of complexity and cascading risks, are leading to a failure of traditional governance models. Firstly, socio-ecological systems are much more complex due to “a combination of hyperconnectivity, nonlinear dynamics, directional change, and emergent properties”⁹. Secondly, externalities — i.e. the indirect consequences of human activities - feedback into our very existence, putting us on a path of mutually assured destruction¹⁰. Sociologist Ulrich Beck referred to a new age of “reflexive modernity” in which boundaries collapse and the planet is “left with “zombie” institutions, practices and thought constructs that no longer respond to reality”¹¹. In the words of Bratton,

The international system could not respond to the planetary crisis because it was not built to do so; it is an architecture of and for another era. For the same reason, it will fail to properly address the climate crises, the political economy of automation, the human right to spatial access and so many other defining questions of our shared future¹².

These are long emergencies and “slow wave conditions”¹³ that cannot be addressed through traditional ‘action–reaction’ (or to elaborate, ‘filter, diagnosis, infrastructure, action’¹⁴) responses to deal with strategic risks. Moreover, they need to be addressed as more than single-point risks because, if the risks around planetary

⁹ Young O., *Governing Complex Systems*, MIT Press (March 10, 2017), cited in Young, O., *Grand Challenges of Planetary Governance: Global Order in Turbulent Times* (2021), p. 5 - <https://www.e-elgar.com/assets/Companion-Pages/Young-Planetary/7a88aba3a1/Grand-Challenges-of-Planetary-Governance-by-Oran-Young.pdf> (the book is available for free as Open Access)

¹⁰ Mutually Assured Destruction (‘MAD’) is a Cold War concept of deterrence based on the assumption that nations that hold weapons of mass destruction will not use them against each other (or each other’s allies) because this would lead to their own destruction as well as any targeted nation.

See also: Femia F. and Werrell C., *Parallels between Mutually Assured Destruction and Inaction on Climate Change, Climate and Security*, The Center for Climate and Security (June 27, 2012) - <https://climateandsecurity.org/2012/06/parallels-between-mutually-assured-destruction-and-inaction-on-climate-change/> and

<https://thebulletin.org/2012/06/climate-madness/>. The authors refer to an article written for the *Bulletin of Atomic Scientists* by Dawn Stover where she compared MAD to climate inaction

¹¹ Beck U., *Individualization: Institutionalized Individualism and Its Social and Political Consequences*, Vol. 13. London, UK: Sage; 2002; and Beck U., *Cosmopolitan Vision*, Cambridge, UK: Polity; 2006; both cited in Boulton E., *Climate change as a ‘hyperobject’: a critical review of Timothy Morton’s reframing narrative: Climate change as a hyperobject*, *Wiley Interdisciplinary Reviews: Climate Change*. 7. 10.1002/wcc.410 (2016)

¹² Bratton B., *New World Order for Planetary Governance* *Strelka Mag* (May 27, 2021) - <https://strelkamag.com/en/article/new-world-order-for-planetary-governance>. See also: Morin, E., and Kern, A. B., *Homeland earth: A manifesto for the new millennium* (1999), Hampton Press and Morin, E., *From Homeland Earth; A New Manifesto For The New Millennium*, *Journal of Conscious Evolution*: Vol. 1: Iss. 1, Article 10. Available at: <https://digitalcommons.ciis.edu/cejournal/vol1/iss1/10>

¹³ *Ibid.*

¹⁴ Soske J., *Small Worlds and Large Worlds*, *Planetary Perspective series*, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/Small-and-Large-Worlds>

challenges materialise, they will have super scale effects. New forms of planning, engagement, relational theory, mobilisation, decision making, diplomacy, contracting, financing, verification and enforcement models and digitally autonomous institutions will be required to deal with the level of entanglement, mutual reliance and interdependence. However, these will likely not be “in forms recognizable to the international system as it exists”¹⁵, particularly when existing and nascent ways of being and being-in-relation-and-reciprocity are taken into account.

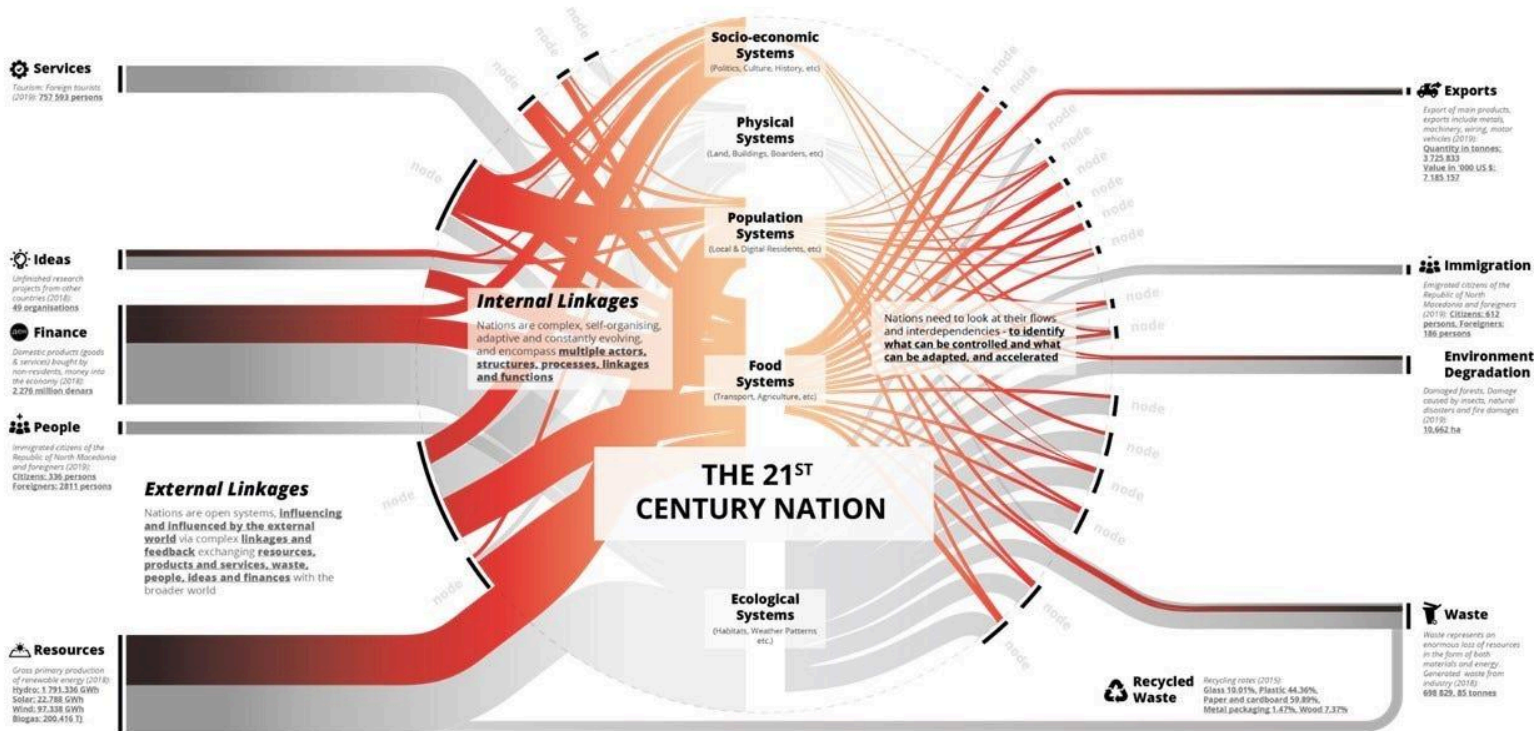


Figure 1. The networked 21st Century nation state. Taken from “Creating a Framework for Human, Machine and Ecological Transition | Republic of North Macedonia”, UNDP North Macedonia and Dm¹⁶

Outdated Institutional Design

Traditionally, global ‘governance’ has been framed in terms of territorial boundaries. However, planetary challenges are impervious to any attempt to frame them within a nation-state paradigm, or even within the Earth’s physical territory itself. Instead, they are orientated around systems and feedback loops operating spatially and

¹⁵ Ibid.

¹⁶ Between 2021 and 2022, Dark Matter Labs worked with UNDP North Macedonia on the creation of a framework to guide the next development strategy of North Macedonia and to serve the needs of human, machine and ecological transition - <https://provocations.darkmatterlabs.org/a-new-way-forward-1534f223eb4b>

temporally. This requires long-term thinking and strategies that operate outside the notion of bounded territory. In this scenario, the nation-state itself is seen as a knotted system of flows impacted by transnational behaviour. Even then, we need to qualify our idea of systems and move towards “degrees of systematicity”¹⁷. Sometimes there is “an illusion of a system where there’s actually something that operates more like temporary islands of structure among the shifting sands of chaos” and which defy easy categorisation¹⁸. Systems analysis therefore needs to be accompanied by “detailed ethnographic and empirical analysis that reveal opacity and breakdown”¹⁹.

Furthermore, the idea of global governance faces two immediate challenges:

Firstly, it is an ex-ante world view, operating on a presumption of predictability and born out of a liberal world order where Western nations — particularly the United States — have been dominant.

However, in the times we live in, financial, political and social systems have evidenced strain under traditional global governance models. This is because fast moving and changeable crises and scenarios simply cannot be adequately planned for in terms of their cascading impact. For example, over the last few years, the Covid-19 pandemic created huge pressures on the global economy and the trade offs that governments had to make continue to manifest domestically (e.g. balancing fiscal prudence with health protection and health protection with personal freedoms). There is a similar prospect that further ecological breakdown may destabilise existing systems e.g. further melting of the glaciers in the Alps will mean that Europe will not have predictable river systems²⁰.

The level of cascading risk is compounded by the fact that policy-making is undertaken by risk-averse governments (i.e. perpetually mindful of the electoral cycle) with siloed and hierarchical decision-making. Governments may be able to act to address the severity of threats. However, these actions may not be swift enough, or the scale of the crisis might absorb an inordinate amount of the administrative and financial machinery of the state, leading to other areas of policy (and importantly other emergent threats) to be neglected. For example, as the Covid-19 crisis receded, it became clear that areas like mental health, cancer treatment, education and financial insecurity had then become acute issues in several countries. In addition, policy-makers may not only

¹⁷ Soske J., Systems... don't exist, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/Systems-Don-t-Exist>

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Please cross-refer to the later table.



be risk averse but actively seek to preserve the status quo — and without recognising or having any interest in recognising the level of externalised risks.

Oran Young, a leading scholar of global environmental governance, states that:

For one thing, we are in need of governance systems that are both robust in the sense that they have the capacity to steer the actions of a variety of actors under a range of conditions and agile or nimble in the sense that they are able to adjust easily and quickly in response to nonlinear developments in complex systems²¹.

Secondly, at the exact moment that we need increased global cooperation on planetary challenges, the world is facing unprecedented geopolitical tensions. The liberal world order is fracturing into regional, competing politico-economic blocs, with rising nationalism and aggressive assertion of state sovereignty²². Regional blocs and nation states will increasingly compete for critical natural resources to bolster sovereignty and their own national interests to ensure food and energy security.

The fracturing of modern geopolitics is also compounded by what Moises Naim has called the 'revenge of tyranny'. Democracy is in global retreat as the rise of populism, polarisation and post-truth have supported a new breed of autocrat and where an existential planetary threat like climate change can itself be used as a tool in national culture wars²³. This can lead to a paralysis of effective policy-making at the national level, but also become part of a strategy for the assertion of national sovereignty and the demonstration of strength on the global stage. In addition, there is a brand of "conditional environmentalism"²⁴ emerging particularly in populist right-wing politics where the environmental crisis may be recognised, but the focus of critical resources management has become one of demographic control²⁵.

At the 78th session of the UN General Assembly ("UNGA 78") in September 2023, António Guterres, the Secretary-General of the United Nations, warned that the world was:

²¹ Young, O. (2021), p. 6

²² Litwak R.S., Geostrategic Competition and Climate Change: Avoiding the Unmanageable, Wilson Center (September 15, 2021) - <https://www.wilsoncenter.org/article/geostrategic-competition-and-climate-change-avoiding-unmanageable>

²³ Naim M., The revenge of tyranny, The New European (May 19, 2022) - <https://www.theneweuropean.co.uk/the-revenge-of-tyranny-by-moises-naim/>. See also: Naim M., The Revenge of Power: How Autocrats Are Reinventing Politics for the 21st Century, St Martin's Press (February 21, 2023)

²⁴ Caiani M. and Lubarda B., Conditional environmentalism of right-wing populism in power: ideology and/or opportunities?, Environmental Politics (2023), DOI: 10.1080/09644016.2023.2242749

²⁵ See: Marin D. and Culot M., Green Supremacy: When Far-Right Politics Co-opts Environmentalism (May 24, 2023), Green European Journal - <https://www.greeneuropeanjournal.eu/green-supremacy-when-far-right-politics-co-opts-environmentalism>

[...] inching ever closer to a great fracture in economic and financial systems and trade relations; one that threatens a single, open internet; with diverging strategies on technology and artificial intelligence; and potentially clashing security frameworks²⁶.

To provide one example, Robert Litwak suggests that:

One could logically argue ... that if the great powers have a mutual interest in averting a climate catastrophe then cooperation in that area could be compartmentalized from geostrategic tensions. But the onset of unconstrained geostrategic competition negates the possibility of compartmentalization²⁷.

Finally, there is an urgent need to open discourse, research and collaboration to more thinkers and doers working in the Global South. Some ideas might predate the liberal world order. Others might envisage futures born out of the experience (and violence) of colonisation and its impacts. Geographies who have experienced colonialism, post-colonial conflict, and political and social upheaval may have factors of resilience and a different lens that can be drawn upon. Experience of and experience of working through crisis can itself be a driver of transformation. It forces us to seize our current reality and in the words of Reinhart Koselleck, transform it "in ways that create altogether new expectations"²⁸. Achille Mbembe has stated that:

Under the leadership of the North, we have relentlessly sought to liberate ourselves from natural and organic environments instead of consciously making room for them. Having decided long ago to chart a Dionysian course in its history and drag the rest of the world with it, the West is now struggling to understand the difference between the beginning and the end, the artificial, the synthetic, and the living. As a result, the world is being sucked into a vast process of laceration, the consequences of which no one can predict²⁹.

²⁶ Wintour P., World inching ever closer to a great fracture, says UN chief, The Guardian (2023) - <https://www.theguardian.com/world/2023/sep/19/world-inching-ever-closer-to-a-great-fracture-says-un-chief>.

Such a preoccupation was in evidence at recent summits of the diverging regional blocs of G7 and BRICS nations. The G7 Hiroshima Leaders' Communiqué in May 2023 laid out a common approach to China's global ambitions. (<https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/g7-hiroshima-leaders-communication/>).

On the other hand, the BRICS summit in August 2023 between Brazil, Russia, India, China, and South Africa agreed on expansion of its member countries in January 2024 (see Carien Du Plessis C., Miridzhanian A. and Acharya B., BRICS welcomes new members in push to reshuffle world order, Reuters (August 25, 2023) - <https://www.reuters.com/world/brics-poised-invite-new-members-join-bloc-sources-2023-08-24/>).

To some BRICS members, this represented a counterbalance to Western influence. The rise of BRICS ambitions have also coincided with increased economic power (see Rushton S., Growth and dominance: how to the G7 and BRICS match up, The National (Aug 22, 2023) - <https://www.thenationalnews.com/world/uk-news/2023/08/22/growth-and-dominance-how-do-the-g7-and-brics-match-up>).

²⁷ Litwak R.S. (2021).

According to Litwak, it divides along the dichotomy between what political theorist Arnold Wolfers classified as "possession goals" and "milieu goals". For John Kerry for example, climate change is "a transcendent issue of global import (i.e. a milieu goal) that should be ring-fenced from other issues" and for which there can and should be increased global cooperation and concerted action. However, for China and Russia, it is "an issue they can leverage or trade off to further their parochial national interests (i.e. possession goals)". Further reading: Vulgar J., Climate Change in World Politics, Palgrave Macmillan (2016)

²⁸ Koselleck, R., & Richter, M. W. (2006). Crisis. Journal of the History of Ideas, 67(2), 357-400. <http://www.jstor.org/stable/30141882>

²⁹ Mbembe A., The Earthly Community, Coloniality of Infrastructure (October 2021), e-flux Architecture - <https://www.e-flux.com/architecture/coloniality-infrastructure/410015/the-earthly-community/>

A Potential New Class of Planetary Hyperobjects

In order to deal with the scale of planetary challenges, there have been various attempts to classify them so as to understand their unique qualities, how they differ to one another, and how they relate to each other and to human and non-human species.

This Position Paper leans into language provided by Timothy Morton. In *Hyperobjects: Philosophy and Ecology after the End of the World*, he classifies climate change as an example of a hyperobject i.e. something so massively distributed in time and space relative to humans that they elude understanding³⁰. He stipulates that technological advancement has allowed such hyperobjects to become visible to humans in the Anthropocene for the first time and that they “compel us to think ecologically, and not the other way around”³¹. However, to do so entails the “smashing” of what we conceive of as the world³² — whether in matter, time or space. Moreover, objects can have as much power to impact humans as vice versa. This, in effect, posits a coexistence model with non-humans.

We acknowledge that the object-oriented lens of the classification model of hyperobjects is simply one philosophical frame and function of a particular human-centred way of thinking. It does not, for example, take account of some Indigenous communities that maintain common goods as part of normative regimes for cohabiting amongst humans and between humans and non-humans, or postcolonial and feminist insights that begin to position “situated knowledge, relational ontologies and embodied practice”³³.

The work of Mbembe may again be highlighted. In *The Earthly Community* or *La communauté terrestre*, he notes that in ancient African cosmogonies, the system of becoming was influenced by the obligation of resonance with the living world that permeates human existence. This obligation was founded on the principle that there is no limit to life flows: “Life builds and rebuilds on the basis of the links that we are continually establishing between all figures of being. What matters is that room be made for all and that no one be excluded”³⁴. The relationship between humans and other planetary

³⁰ Morton T. *Hyperobjects Philosophy and Ecology after the End of the World*, Minneapolis: University of Minnesota Press; 2013, p. 1

³¹ Ibid., p. 48; also cited in Daggett C., *Hyperobjects By Timothy Morton*, Society + Space Journal (September 5, 2014) - <https://www.societyandspace.org/articles/hyperobjects-by-timothy-morton>

³² Ibid., p. 127

³³ Shankar P., *No-one lives on the globe*

³⁴ Mbembe A., *The Earthly Community*, Coloniality of Infrastructure (October 2021), e-flux Architecture - <https://www.e-flux.com/architecture/coloniality-infrastructure/410015/the-earthly-community/>



beings is not based on “a thirst for conquest and appropriation” but an “ethics of disappropriation” to “increase the reserves of life and share in the primordial breath that unites and animates the community inasmuch as the latter is composed of the dead, the living, ancestors, beings and things, animals, plants, objects, and spirits”³⁵. This way of seeing the world also exposes us to both the unknown and unforeseeable³⁶.

Morton’s frame can be a “familiar and manageable”³⁷ entry point for the purposes of this Position Paper, as it allows us to apprehend the enormity of planetary challenges in terms of their scale and scope, occupying a transnational problem-space, having cascading impacts, and lying beyond anything human beings have had to comprehend or contend with before. Furthermore, this frame already reaches out towards technology as a way to help govern co-existence on Earth.

In the *Design Manual for the Polycene* (the “Manual”), the Center for Complexity at RISD has expanded this frame further³⁸. It uses ‘**Planetary Phenomena**’ to define “the intricate and interconnected dynamics that shape our planet’s systems and processes, encompassing a diverse array of objects, flows, and active entities”:

- ① **Planetary Objects** are seen as “knots of matter and energy, facilitated by and through mass multi-actor agencies and coordinated at a scale not previously possible”. The Manual acknowledges Morton’s idea of hyperobjects;
- ② **Planetary Flows** through space and time allow us to begin to move our comprehension towards understanding the “dynamic, volatile, often hidden, and non-linear connected existence of these massive constructs”; and
- ③ **Planetary Beings** enable an understanding beyond a simply human paradigm and to begin to ascribe “properties of power, agency, and even personality” to such phenomena that might help to begin the work of “ecological construction”. This classification is presented as a way to “explore how these interactions shape the world we inhabit and to prompt us to rethink our understanding of responsibility, comprehension, and intervention within the context of a rapidly changing world”³⁹.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Sequeira C., Shankar P. and Maly T., *What are planetary phenomena?*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/What-are-Planetary-Phenomena>

³⁸ Ibid.

³⁹ Ibid.





Figure 2. Planetary Phenomena.⁴⁰

Hyperobjects present great uncertainty and embody interconnected and cascading planetary-scale risks. They could spark regional flashpoints and conflict. Moreover, there is added complexity with the convergence of nanotechnology, biotechnology, information technology, and cognitive science (“NBIC”) — all major technologies for improving human performance. We do not yet know how to govern hyperobjects at a planetary scale individually, much less when they converge and shape both the military and civilian space.

However, this Position Paper aims to strike a hopeful note.

Our objective is to use the beginning of conversations around hyperobjects — and planetary phenomena — to create an experimental zone for planetary thinking around governance and relational theory for entangled futures.

We passionately ascribe to the belief that this is a pivotal moment in time and that a growing cluster of key stakeholders can coalesce, collaborate, co-produce and ultimately communicate transformative pathways that allow those in public policymaking (but also all impacted stakeholders) to take and/or accept brave decisions for the collective good.

⁴⁰ Ibid.

Hyperobjects as Potential Conflict Zones

① Common Goods with Planetary Stakes and Impacts

A. Hindu Kush Himalayan (HKH) region

This region is popularly known as the 'roof of the world' and has the largest area of permanent ice cover outside of the north and south poles. It supports almost 40 percent of the global population across eight countries (Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan), and is under severe stress with "climate change, disasters, economic growth, globalisation, infrastructure development, land use change, migration and urbanisation"⁴².

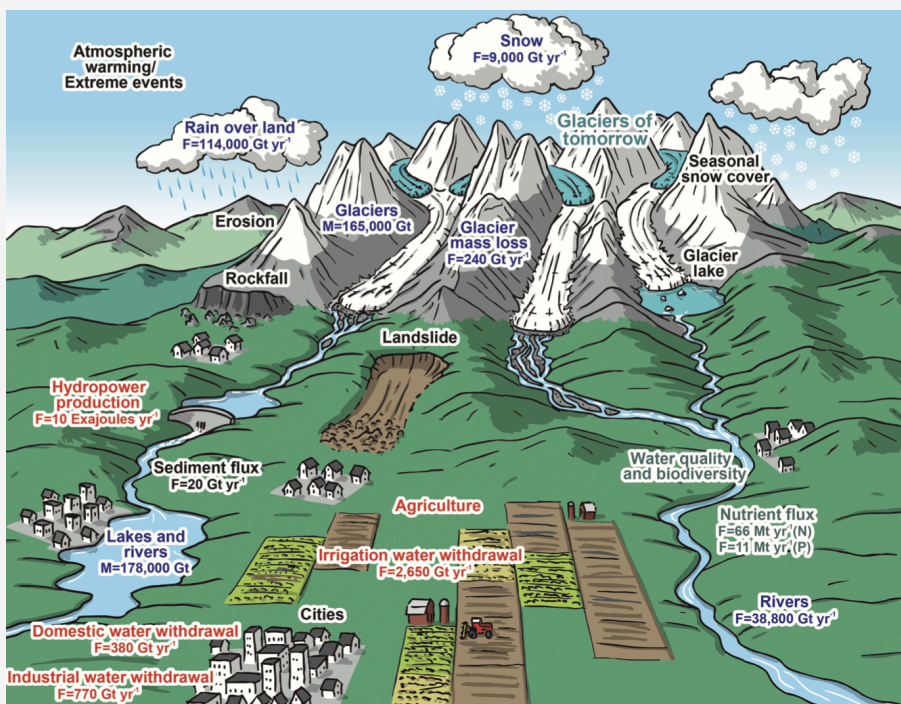


Figure 3. Taken from Huss, M., Bookhagen, B., Huggel, C., Jacobsen, D., Bradley, R. S., Clague, J. J., et al. (2017). Toward mountains without permanent snow and ice.

The higher elevations of the HKH glaciers are at risk of melting and breaking due to the increased intensity of natural disasters and shift in weather patterns as a result of climate change⁴³. This could impact snow and

The following table presents a range of hyperobjects. It is not a comprehensive analysis of the area in question, nor does it present a full spectrum. Such hyperobjects include:

- ① **Common goods with planetary stakes and impacts**, such as the Himalayas, the Alps, the Amazon rainforest, the Congo rainforest, river systems (e.g. the Nile as an existing and potential conflict zone⁴¹ and the Niger Delta as a site of historic extraction, conflict and intense poverty and inequality), air systems and the management of climate induced wildfires, loss of the Arctic sea ice, deep sea mining of international waters and critical minerals, and global supply chains;
- ② **Planetary proliferation threats** such as pandemics, computer or biological viruses, and nuclear or biological weapons that potentially provide serious and immediate risks to life and security;
- ③ **Planetary critical infrastructures** such as planetary cables and satellite networks.

⁴¹ Please note that later in this Position Paper, the Danube river will be used as an illustrative example of a potential solution space.

⁴² Aggarwal M., *Melting Himalayas put billions at risk*, Mongabay (February 6, 2019) - <https://india.mongabay.com/2019/02/melting-himalaya-puts-billions-at-risk>.

⁴³ Safdie S., *What Will Happen if the Himalayan Glacier Melts or Breaks?* (June 30, 2023), Greenly (The Climate Expert's Blog) - <https://greenly.earth/en-gb/blog/ecology-news/what-will-happen-if-the-himalayan-glacier-melts-or-breaks#:~:text=This%20is%20because%20higher%20elevations,the%20available%20supply%20of%20water.>

rainfall, reducing the availability of water supply. A 2023 report by the International Centre for Integrated Mountain Development ("ICIMOD")⁴⁴ found that on current emissions pathways, 80% of glaciers' current volume will be gone by 2100 and that availability of water would peak in mid-century but then decline.

A 2019 report 'Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability, and People'⁴⁵ called for "greater transboundary cooperation in regional aspects of conservation and development" to sustain this "global asset"⁴⁶.

B. The Alps

Scientists have estimated that 80 percent of glaciers in the European Alps may disappear by the end of the 21st century⁴⁷. This could have severe consequences⁴⁸ for water supply, hydropower, production capacity at nuclear plants given lack of water for cooling, and the flow of major rivers such as the Rhône, Rhine, Danube and Po which would impact agriculture and transport.

A report⁴⁹ by the Alpine Convention (i.e. the group of eight Alpine countries plus the EU) stated that "the reduction in the amount of water available and the limited reliability of the supply will be a major problem in the decades to come" if solutions are not found⁵⁰. Moreover, Kaspar Schuler, Director of CIPRA International (an organisation that is committed to protecting the Alps) has said that whilst governments have "put water on the agenda", they have so far stopped short of the sort of interventions that are needed to avoid long term catastrophe⁵¹.

C. Nile Basin

The dispute between Ethiopia and Egypt (and to a lesser extent Sudan) over the building of the Grand Ethiopian Renaissance Dam ("GERD") has lasted more

⁴⁴ *Water ice society ecosystems in the Hindu Kush Himalaya* (June 26, 2023). For full report: <https://hkh.icimod.org/hi-wise/hi-wise-report>.

⁴⁵ Wester P., Mishra A., Mukherj A., Shrestha A. B., *Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability, and People*, International Centre for Integrated Mountain Development (ICIMOD) (January 21, 2019) - <https://doi.org/10.1007/978-3-319-92288-1>.

⁴⁶ Aggarwal M. (2019)

⁴⁷ Huss, M., Bookhagen, B., Huggel, C., Jacobsen, D., Bradley, R. S., Clague, J. J., et al. (2017), *Toward mountains without permanent snow and ice*. *Earth Fut.* 5, 418–435. doi: 10.1002/2016EF000514 - https://www.researchgate.net/publication/317014183_Toward_mountains_without_permanent_snow_and_ice

⁴⁸ See: Novo C., *Shrinking Alpine glaciers will impact Europe's water resources* (September 8, 2022), *Smart Water Magazine* - <https://smartwatermagazine.com/news/smart-water-magazine/shrinking-alpine-glaciers-will-impact-europes-water-resources#:~:text=As%20the%20E%80%9Cwater%20towers%20of,transport%20on%20Europe%27s%20main%20waterways>.

For example, last year a combination of sparse rainfall and a gruelling heatwave in Northern Italy melted snowfields and glaciers, dried up the River Po and threatened drinking water and irrigation in a region called the food valley of Italy (Jones T., *Quiet flows the Po: the life and slow death of Italy's longest river* (July 10, 2023), *The Guardian* - <https://www.theguardian.com/environment/2022/jul/10/po-river-italy-drought-climate>)

⁴⁹ *9th Report on the State of the Alps* (October 2022), Alpine Convention - <https://alpinetowns.alpconv.org/>

⁵⁰ Keaten J., *Battle of the Alps? Water woes loom amid climate change* (October 27, 2022), AP - <https://apnews.com/article/europe-middle-east-business-france-switzerland-19067a12f1ba6e5c965be0cf15f5ff>

⁵¹ *Ibid.*

than a decade. Ethiopia recently declared that the fourth and final filling of the GERD was now complete⁵².

Over 90% of Nile water comes from the Ethiopian highlands and Egypt relies on the Nile for 97% of its water needs⁵³. According to a UNICEF report published two years ago, Egypt could be water scarce by 2025⁵⁴. Egypt had relied on British colonial-era treaties which gave it a disproportionate share of the use of the Nile⁵⁵. It is now pushing for a fair legal treaty, calling the filling of the GERD as illegal⁵⁶.

Egypt's national identity is so tied to the Nile that it has been argued that "GERD will lead to re-structuring Egypt's state identity conception while potentially serving as an anchor to Ethiopia's changing ontological security"⁵⁷.

Moreover, to add to the security risk surrounding this dispute, the BRICS regional grouping may have absorbed this conflict by offering membership to Egypt and Ethiopia. This raises questions on China's ability to maintain its traditional non-intervention policy in African affairs since it has "made significant investments in Ethiopia, including in GERD-related infrastructure"⁵⁸.

D. Niger Delta

The Niger Delta has been a site of extraction in various forms. From a subsistence economy, it became a vital cog in the transatlantic slave trade in the nineteenth and twentieth centuries. Following the Industrial Revolution, local communities accumulated wealth from the palm oil trade⁵⁹. For the last 70 years, oil and gas exploration has heavily damaged the environment, including oil spills amounting to an estimated 500 million gallons of oil⁶⁰. This has fuelled protest action by local activists. The Niger Delta is the third largest wetland in the world and the largest river delta and mangrove ecosystem in Africa, with the largest

⁵² Filling of Grand Renaissance Dam on the Nile complete, Ethiopia says (September 10, 2023) - <https://www.aljazeera.com/news/2023/9/10/filling-of-grand-renaissance-dam-on-the-nile-complete-ethiopia-says>

⁵³ Ibid.

⁵⁴ Water Scarcity in Egypt: Growing Concerns, and Partnerships (2021), UNICEF Egypt- <https://www.unicef.org/egypt/documents/water-scarcity-egypt>

⁵⁵ Tekuya M., Colonial-era treaties are to blame for the unresolved dispute over Ethiopia's dam (March 25, 2020), The Conversation - <https://theconversation.com/colonial-era-treaties-are-to-blame-for-the-unresolved-dispute-over-ethiopia-dam-133538>

⁵⁶ Ibid.

⁵⁷ Gebresenbet F. and Wondemagegnehu D. Y. (2021), New Dimensions in the Grand Ethiopian Renaissance Dam Negotiations: Ontological Security in Egypt and Ethiopia, African Security, 14:1, 80-106, DOI: 10.1080/19392206.2021.1905921 - <https://www.tandfonline.com/doi/abs/10.1080/19392206.2021.1905921>

⁵⁸ Fenton-Harvey J., BRICS Now Owns Egypt and Ethiopia's Nile Dam Dispute (September 18, 2023), World Politics Review - <https://www.worldpoliticsreview.com/ethiopia-dam-nile-egypt/>

⁵⁹ Asuk, OC. (2011). *Two Oils, Same Phenomena: Historicizing Exclusion, Poverty and Contemporary Violence in the Niger Delta*. African Research Review. 5. 10.4314/afrr.v5i2.67296.

⁶⁰ Taylor A., *Nigeria: The Cost of Oil*, The Atlantic (June 8, 2011) - <https://www.theatlantic.com/photo/2011/06/nigeria-the-cost-of-oil/100082/>

expansion of freshwater swamps⁶¹. The Niger Delta may be an ideal site to engage in practice of decoloniality and different ways of seeing and knowing 'beyond human'.

E. The Amazon Rainforest

The Amazon rainforest is the world's largest rainforest covering nearly seven million square kilometres⁶² and spread across nine countries (Brazil, Ecuador, Venezuela, Suriname, Peru, Colombia, Bolivia, Guyana and French Guiana). It makes its own weather, generates some of its own rainfall cycles and not only cools itself but helps to stabilise regional temperatures⁶³. The Amazon's volume of trees (estimated at nearly 400 billion⁶⁴) is one of the world's largest carbon sinks storing more than 150 billion metric tonnes of carbon⁶⁵, half of which is in the soil with the other half in its trees.

However, deforestation and its impacts are putting this at risk. According to Carlos Nobre, an Earth systems scientist at the University of São Paulo and co-chair of the Science Panel for the Amazon, the rainforest is being pushed towards a minimum threshold of tree cover - below which it would degrade simply into a grassland habitat⁶⁶. The Amazon is reaching a tipping point where it is losing its ability to recover from human development, drought and wildfire⁶⁷. This could result in local rainfall reducing by up to 30 percent, resonating as far as Colombia and Argentina where rainfall cycles are nourished by moisture from the Amazon⁶⁸. Furthermore, modelling by Elena Shevliakova, a scientist at the Geophysical Fluid Dynamics Laboratory at the National Oceanic and Atmospheric Administration Office of Oceanic and Atmospheric Research in the United States, has indicated that the release of 120 billion metric tonnes of CO₂ by removing forest (a cautious estimate of carbon stores) would warm the planet by approximately 0.25 degree Celsius⁶⁹.

⁶¹ Adekola, O., & Mitchell, G. (2011). *The Niger Delta wetlands: threats to ecosystem services, their importance to dependent communities and possible management measures*. International Journal of Biodiversity Science, Ecosystem Services & Management, 7(1), 50–68. <https://doi.org/10.1080/21513732.2011.603138>

⁶² For further information see: *Top Facts About The Amazon*, WWF - <https://www.wwf.org.uk/learn/fascinating-facts/amazon#:~:text=The%20Amazon%20rainforest%20covers%20an,the%20side%20of%20the%20UK!>

⁶³ Bryce E., *Why Is the Amazon So Important for Climate Change?* (February 20, 2023), Scientific American - <https://www.scientificamerican.com/article/why-is-the-amazon-so-important-for-climate-change/>

⁶⁴ *Top Facts About The Amazon*, WWF - <https://www.wwf.org.uk/learn/fascinating-facts/amazon#:~:text=The%20Amazon%20rainforest%20covers%20an,the%20side%20of%20the%20UK!>

⁶⁵ Bryce E. (2023)

⁶⁶ Bryce E. (2023)

⁶⁷ Harvey C., *Amazon Rain Forest Nears Dangerous 'Tipping Point'* (March 8, 2022), Scientific American - <https://www.scientificamerican.com/article/amazon-rain-forest-nears-dangerous-tipping-point/>

⁶⁸ Bryce E. (2023)

⁶⁹ Bryce E. (2023)

F. The Congo Rainforest

The Congo Basin stands as the world's second-largest tropical forest and "serves as the lungs of Africa"⁷⁰. It is "a mosaic of forests, swamps and savannas twice the size of Alaska"⁷¹, one of the most biodiverse regions in the world and home to some of the most endangered species.

The Congo Basin holds the second largest unbroken tropical primary forest after the Amazon. Its trees are taller and historically said to be more resilient to climate change than the Amazon rainforest - able to absorb approximately [1.2 billion tonnes](#) of carbon dioxide each year and [store](#) one third more carbon over the same area of land than the Amazon. However, research by Simon Lewis, Professor of Global Change Science at University College London, has found that climate change is reducing the ability of the Congo rainforest to absorb carbon dioxide. At the same time, the number of trees is reducing as a result of land-grabbing and industrial activity (such as logging, palm oil plantations, mining and industrial-scale agriculture). The Congo Basin is also one of the least protected as a result of decades of conflict and civil unrest and illegal wildlife trafficking.

G. Air Systems and Wildfire Management

The key drivers of wildfires are climate change, unsustainable land use and deforestation. Wildfires present significant risk to human settlements and their continued viability i.e. posing an immediate danger to human and non-human life and habitats, contributing to respiratory and cardiovascular issues⁷², and can result in a loss of assets, prohibitive costs of insurance, impacted livelihoods e.g. lost tourism and ultimately migration. They also add a significant cost to the public sector in terms of fire suppression.

There may be examples of nascent collective governance of such planetary shared risks emerging between countries where the hyperobject emerges and where it also impacts. For example, over the past summer, Canada experienced unprecedented wildfires with more than 11 million hectares burnt⁷³. In response, the United States deployed more than 2,000 wildland firefighters and support personnel to Canada.

⁷⁰ See Greenpeace - <https://www.greenpeace.org/usa/forests/congo-basin/>

⁷¹ See Rainforest Trust - <https://www.rainforesttrust.org/our-impact/global-scope/congo-basin/>

⁷² Koudenoukpo J.B., *As Wildfires Increase, Integrated Strategies for Forests, Climate and Sustainability Are Ever More Urgent*, UN Chronicle, United Nations (July 31, 2023) - <https://www.un.org/en/un-chronicle/wildfires-increase-integrated-strategies-forests-climate-and-sustainability-are-ever-0>

⁷³ Florea S., *US firefighters continue to support Canada during record-breaking wildfires*, National Interagency Fire Center (July 19, 2023) - [https://www.nifc.gov/fire-information/news-releases/us-firefighters-continue-support-canada-during-record-breaking#:~:text=Boise%2C%20Idaho%20E2%80%93%20More%20than%202%2C000,Interagency%20Fire%20Center%20\(NIFC\).](https://www.nifc.gov/fire-information/news-releases/us-firefighters-continue-support-canada-during-record-breaking#:~:text=Boise%2C%20Idaho%20E2%80%93%20More%20than%202%2C000,Interagency%20Fire%20Center%20(NIFC).)

H. Loss of Arctic Sea Ice

All land, internal waters, territorial seas and Exclusive Economic Zones in the Arctic region (i.e. North Pole, the Arctic Ocean and the area demarcated as the Arctic Circle) has been under the jurisdiction of one of the eight Arctic coastal states: Canada, Denmark (via Greenland), Iceland, Norway, Sweden, Finland, the United States (via Alaska) and Russia – with the seven Western states referred to as the Arctic Seven. However the era of cooperation under the United Nations Convention of the Law of the Sea (“UNCLOS”) that has governed claims of Arctic sovereignty has faced two recent threats:

- ◆ At the time of the Russian invasion of Ukraine, Russia held the chairmanship of the Arctic Council, the high-level intergovernmental forum. This led to official meetings being paused, with the Arctic Seven continuing to cooperate without Russia. In 2023, Norway took over the Chairmanship of the Arctic Council⁷⁴ – a country that has a history of “pragmatic engagement” with its Russian neighbour⁷⁵. This means that at least minimum and crucial scientific data exchange with Russia might be possible⁷⁶. However, as noted in the new National Strategy for the Arctic Region published by the White House⁷⁷, cooperation with Russia is “virtually impossible at present”⁷⁸. This has led to much discussion on the future of Arctic Council governance⁷⁹;
- ◆ Moreover, whilst the sheer geography of the Arctic had prevented the emergence of any recognised claim of national jurisdiction over resources or passageways, as the ice retreats, “so too does the most significant physical impediment to the exploitation of its resources”⁸⁰. Competing states have tried to asset control by redefining the limits of their continental shelves beyond 200 nautical miles⁸¹. Crucially in 2021, Russia filed a

⁷⁴ Norway's Chairship 2023-2025 - <https://arctic-council.org/about/norway-chair-2/>

⁷⁵ Gricius G., *From Russia to Norway: Three Scenarios for the Arctic Council's future after the Chairmanship handover* (April 25, 2023), European Leadership Network - <https://www.europeanleadershipnetwork.org/commentary/from-russia-to-norway-three-scenarios-for-the-arctic-councils-future-after-the-chairmanship-handover/>

⁷⁶ Ibid.

⁷⁷ *National Strategy For The Arctic Region (October 2022)*, The White House - <https://www.whitehouse.gov/wp-content/uploads/2022/10/National-Strategy-for-the-Arctic-Region.pdf>

⁷⁸ Ibid. p. 14.

⁷⁹ Gricius G., *From Russia to Norway: Three Scenarios for the Arctic Council's future after the Chairmanship handover*, European Leadership Network (April 25, 2023) - <https://www.europeanleadershipnetwork.org/commentary/from-russia-to-norway-three-scenarios-for-the-arctic-councils-future-after-the-chairmanship-handover/>

⁸⁰ Clote, P., *Implications of Global Warming on State Sovereignty and Arctic Resources Under the United Nations Convention on the Law of the Sea: How the Arctic is no Longer Communis Omnium Naturali Jure*, 8 Richmond Journal of Global Law & Business, Vol. 8. (Winter 2008): 195-248. Available at: <http://scholarship.richmond.edu/global/vol8/iss2/4> - p. 198

⁸¹ Ibid., p. 199

submission to the United Nations in respect of legally expanding the outer boundaries of its continental shelf (believed to contain vast untapped reservoirs of oil and gas), impinging on claims by Canada and Denmark⁸²;

- ◆ Moreover, several countries have disputed the dominance of the Arctic coastal states as they see the Arctic as a global commons with its resources as “common goods” available for any state to access⁸³. China for example has advocated that the Arctic’s waterways and the central Arctic Ocean are international waters as a means of developing shipping routes⁸⁴;
- ◆ Another caveat needs to be noted in terms of the decolonisation agenda. Klaus Dodds, Professor of Geopolitics at Royal Holloway, University of London has stated that the Arctic “as a contact zone, imaginative and embodied, remains ongoing and contested as indigenous peoples continue to campaign over land claims, and demand greater autonomy, consultation and social justice”⁸⁵.

I. Deep Sea Mining of International Waters

The drive to net zero requires the development of new technologies which depend on a supply of critical materials. The International Seabed Authority (“ISA”) is entrusted with managing mineral resources in and on the floor of the ocean “for the benefit of humankind as a whole”. It has granted exploration licences in the deep seabed for 22 contractors⁸⁶, 19 of which are for polymetallic nodules in the Clarion Clipperton Zone in the Pacific. A scandal erupted this year when Michael Lodge, the Secretary-General of the ISA, was accused of abandoning neutrality and “resisting measures put forward by some council members that could slow down approval”⁸⁷.

Voices like the Deep Ocean Stewardship Initiative (“DOSI”) and Greenpeace have criticised the race to the bottom of the sea as catastrophic for marine life and its delicate ecosystem. Diva Amon of DOSI has stated that: “We’re talking about areas beyond national

⁸² *Putin discusses Russia's claim to giant chunk of Arctic Ocean seabed* (January 27, 2023), Reuters - <https://www.reuters.com/world/europe/putin-discusses-russias-claim-giant-chunk-arctic-ocean-seabed-2023-01-27/>

⁸³ Burke D. C., *Why the Arctic isn't a 'global commons'* (April 8, 2018), The Conversation - <https://theconversation.com/why-the-arctic-isnt-a-global-commons-93976>

⁸⁴ *Full text: China's Arctic Policy* (January 26, 2021) - http://www.xinhuanet.com/english/2018-01/26/c_136926498.htm

⁸⁵ Dodds K., *What we mean when we talk about the Global Arctic* (February 18, 2016), The New Humanitarian - <https://deeply.thenewhumanitarian.org/arctic/community/2016/02/18/what-we-mean-when-we-talk-about-the-global-arctic>

⁸⁶ Exploration Contracts, ISA - <https://www.isa.org.jm/exploration-contracts/>

⁸⁷ *Ibid.*

jurisdiction, or international waters, which is where mineral resources belong to everyone on the planet.”

So far 25 countries have taken positions against deep-sea mining in international waters⁸⁸.

J. Critical Minerals and Global Supply Chains

Decarbonisation in response to climate change and digital transition (with AI and 5G networks) has triggered a race to secure access to critical raw minerals that are essential for high-technology applications⁸⁹.

Thea Riofrancos, an associate professor of political science at Providence College in the United States, has advanced that such minerals are now the

[...] terrain of geopolitics. Or—perhaps better put—of **geoeconomics**: the intermingling of national security and economic policy. Seen through a geoeconomic lens, the supply chains of green technologies such as solar panels and lithium batteries are battlefields of zero-sum interstate competition⁹⁰.

However, whilst countries and companies might seek to reduce supply chain risk:

[...] this creates another kind of risk as offtake agreements and equity stakes claim critical mineral supplies for some while leaving other parties with insufficient supply to achieve their Net Zero ambitions⁹¹.

China currently accounts for 60 percent of global production and 85% of global processing⁹². Western countries are turning increasingly to Africa—that holds one third of global supply—but this also creates a risk that:

[...] intensified development of these natural resources could worsen economic inequalities,

⁸⁸ McVeigh K., *Row erupts over deep-sea mining as world races to finalise vital regulations* (March 21, 2023), The Guardian - <https://www.theguardian.com/environment/2023/mar/21/row-erupts-over-deep-sea-mining-as-world-races-to-finalise-vital-regulations>; and

McVeigh K., *UK backs suspension of deep-sea mining in environmental U-turn* (October 30, 2023), The Guardian - <https://www.theguardian.com/environment/2023/oct/30/uk-backs-suspension-of-deep-sea-mining-in-environmental-u-turn>. For an updated list of countries and positions see: The Deep Sea Conservation Coalition - <https://savethehighseas.org/voices-calling-for-a-moratorium-governments-and-parliamentarians/>.

⁸⁹ Kalantzakos S., *The Race for Critical Minerals in an Era of Geopolitical Realignments* (2020), The International Spectator, 55:3, 1-16, DOI: 10.1080/03932729.2020.1786926 - <https://www.tandfonline.com/doi/abs/10.1080/03932729.2020.1786926>

⁹⁰ Riofrancos T., *Shifting Mining From the Global South Misses the Point of Climate Justice* (February 7, 2022), Foreign Policy - <https://foreignpolicy.com/2022/02/07/renewable-energy-transition-critical-minerals-mining-onshoring-lithium-evs-climate-justice/>

⁹¹ The Race for Critical Minerals (February 2, 2023), ISS Insights - <https://insights.issgovernance.com/posts/the-race-for-critical-minerals/>

⁹² Burrier E. A. and Sheehy T. P., *Challenging China's Grip on Critical Minerals Can Be a Boon for Africa's Future* (June 7, 2023), United States Institute for Peace - <https://www.usip.org/publications/2023/06/challenging-chinas-grip-critical-minerals-can-be-boon-africas-future>



increase corruption and spur instability and conflict on the continent⁹³.

In addition, mining has also led to local unrest and raised a number of justice issues. In Chile, lithium production for example has “imperilled water access, threatened biodiversity, and violated Indigenous rights”⁹⁴.

② Planetary Proliferation Threats

A. Pandemics

A recent report by the open science platform MDPI noted that: “In the past century, five global pandemics—four influenza and the current coronavirus disease 2019 (COVID-19) pandemic—have caused tens of millions of deaths worldwide as well as massive disruptions to economies, global progress, and people’s lives”.

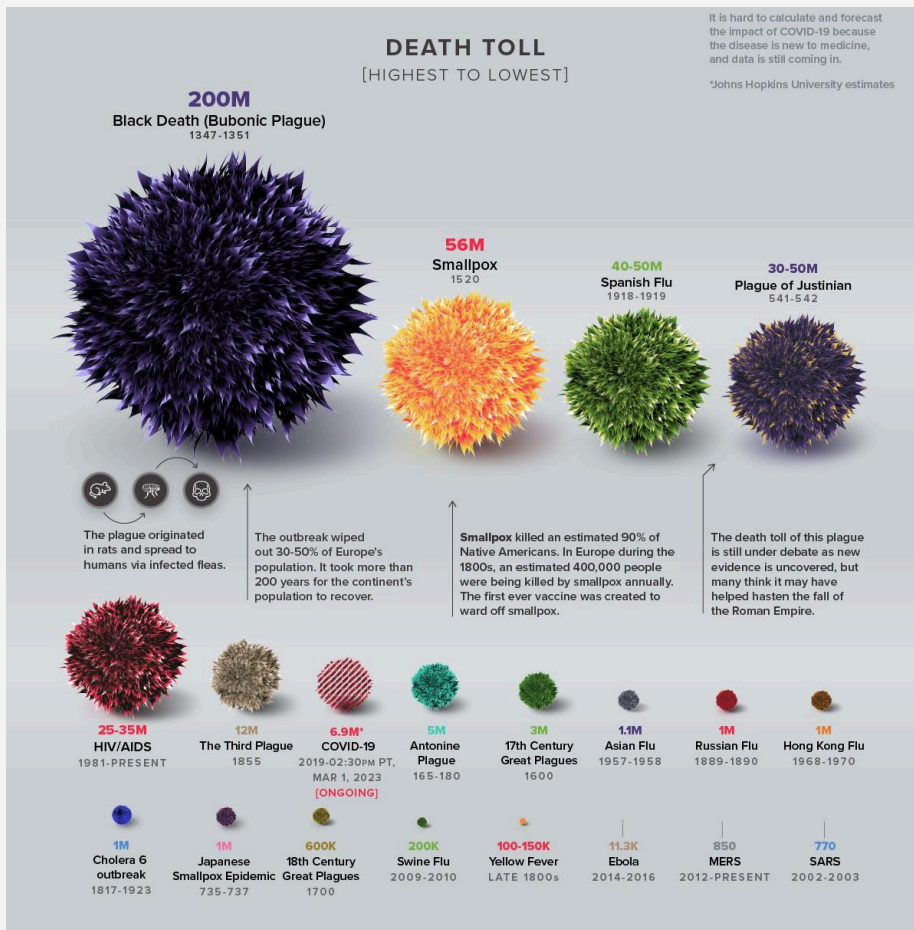


Figure 4. Taken from LePan, Nicholas. “Visualizing the History of Pandemics.” Visual Capitalist, March 14, 2020. <https://www.visualcapitalist.com/history-of-pandemics-deadliest>.

⁹³ Ibid.

⁹⁴ Ibid.

The report covered the unprecedented measures that governments felt forced to take to mitigate the spread of Covid-19 prior to the production of effective vaccines and talked of the need for investment in pandemic research and preparedness.

WHO Director, General Dr. Tedros Adhanom Ghebreyesus, has said that: "When the next pandemic comes knocking — and it will — we must be ready to answer decisively, collectively and equitably". WHO member states are working on a global pandemic accord to be ready for consideration by the 77th World Health Assembly in 2024. This would be:

[..] a generational commitment that we will not go back to the old cycle of panic and neglect that left our world vulnerable, but move forward with a shared commitment to meet shared threats with a shared response⁹⁵.

B. Computer or Biological Viruses

Both types of viruses have similar characteristics⁹⁶:

- ◆ Biological viruses mutate naturally (and create new viruses) and impact ecosystems and similarly, malwares invade computer systems but can be further iterated by hackers. Indeed "most computer malware was designed to emulate biological viruses in terms of infiltration into the bodies — or computer networks — of the organisms it wants to attack, the exponential spread of infection and the damage caused"⁹⁷;
- ◆ Neither virus discriminates amongst potential victims and both cause the greatest damage to the most vulnerable and least prepared⁹⁸;
- ◆ Neither virus respects geographic boundaries and can mutate or iterate and spread across human or data systems.

An emerging issue in respect of research is access to data e.g. key global infrastructure for pathogen sharing like the GISAID database has been subject to unpredictable gatekeeping, with no clear policies⁹⁹.

⁹⁵ Chasan A., *Prepare for next pandemic, future pathogens with "even deadlier potential" than COVID*, WHO chief warns (May 23, 2023), CBS News - <https://www.cbsnews.com/news/next-pandemic-threat-pathogen-deadlier-than-covid-world-health-organization/>.

See also: *Countries begin negotiations on global agreement to protect world from future pandemic emergencies* (March 2, 2023), World Health Organisation - <https://www.who.int/news/item/03-03-2023-countries-begin-negotiations-on-global-agreement-to-protect-world-from-future-pandemic-emergencies>

⁹⁶ Taken from Gupta S., Cherukuri A.K., Subramanian C.M., Ahmad A. (2022), *Comparison, Analysis and Analogy of Biological and Computer Viruses*. In: Tyagi A.K., Abraham A., Kaklauskas A. (eds), *Intelligent Interactive Multimedia Systems for e-Healthcare Applications*. Springer, Singapore. https://doi.org/10.1007/978-981-16-6542-4_1 - https://link.springer.com/chapter/10.1007/978-981-16-6542-4_1#citeas

⁹⁷ Cookson B., *Some musings on the parallels between biological viruses and computer viruses* (March 15, 2021), LinkedIn.

⁹⁸ Ibid.

⁹⁹ See: <https://twitter.com/theosanderson/status/1716463132925657459>

C. Nuclear and Biological Weapons

The “proliferation of weapons of mass destruction (“WMD”) and their delivery systems could have incalculable consequences for national, regional and global security”, whether “nuclear devices, radiological material, biological pathogens and chemical substances”¹⁰⁰. A recent Op-Ed in the Wall Street Journal spoke of how the next global conflict may “not involve conventional warfare but could see the use of biological and computer viruses”¹⁰¹.

3. Planetary Critical Infrastructure

A. Planetary Cables

Approximately 1.5 million kilometres of submarine fibre optic cables “underpin the entire global internet and our modern information age”¹⁰². Most countries depend on such ‘information superhighways’¹⁰³ for their economy and national security.

A report by Insikt Group for Recorded Future¹⁰⁴ noted that: “Major geopolitical developments, specifically Russia's conflict with Ukraine, China's preparations for potential forceful unification with Taiwan, and the deterioration of US-China relations, are likely to fuel physical attacks and intelligence collection efforts against submarine cables”¹⁰⁵.

The Australian Strategic Policy Institute has suggested that “a comprehensive approach is required to address the resilience of undersea communications cables. There’s no international treaty to protect against physical or cyberattacks on undersea cables”¹⁰⁶. In the meantime, countries like Australia have legislated to

¹⁰⁰ *Weapons of mass destruction* (February 27, 2023), NATO - https://www.nato.int/cps/en/natohq/topics_50325.htm

¹⁰¹ Neuro B., *National Security Adviser Warns World War III May Not Involve Guns And Bombs, But Biological And Computer Viruses* (July 6, 2023), Benzinga - <https://www.benzinga.com/government/23/07/33142638/national-security-adviser-warns-world-war-iii-may-not-involve-guns-and-bombs-but-biological-and-comp>. See also original Op Ed: Muller R. A., *World War III Will Be Fought With Viruses* (July 6, 2023), Wall Street Journal - <https://www.wsj.com/articles/world-war-iii-virus-vaccine-biological-weapon-russia-ukraine-china-covid-cybersecurity-hack-162a8b08>

¹⁰² Gervasi P., *Diving Deep into Submarine Cables: The Undersea Lifelines of Internet Connectivity* (March 28, 2023), Kentick.

¹⁰³ *The Escalating Global Risk Environment for Submarine Cables* (June 27, 2023), Recorded Future - <https://www.recordedfuture.com/escalating-global-risk-environment-submarine-cables>.

¹⁰⁴ Ibid.

¹⁰⁵ Notably, Russia has shown intent to map the submarine cable system in the Atlantic Ocean and North Sea, very likely for potential sabotage”. In January 2022, the UK’s defence chief, Tony Radakin, warned that Russian activities were directly threatening submarine cable systems (*UK military chief warns of Russian threat to vital undersea cables* (January 8, 2022), PA Media - <https://www.theguardian.com/uk-news/2022/jan/08/uk-military-chief-warns-of-russian-threat-to-vital-undersea-cables>).

At the present time, China and Russia are the focus of an investigation by Finland and Estonia in respect of damage to a telecoms cable between the two countries, as well as to the Baltconnector gas pipeline (*China ship NewNew Polar Bear is focus of pipeline damage probe, Finland says* (October 21, 2023), Reuters - <https://www.scmp.com/news/world/europe/article/3238726/china-ship-newnew-polar-bear-focus-pipeline-damage-probe-finland-says>)

¹⁰⁶ Bashfield S. and Bergin, A., *Options for safeguarding undersea critical infrastructure: Australia and Indo-Pacific submarine cables* (June 2022), ANU National Security College.

protect cable links by creating seabed protection zones¹⁰⁷.

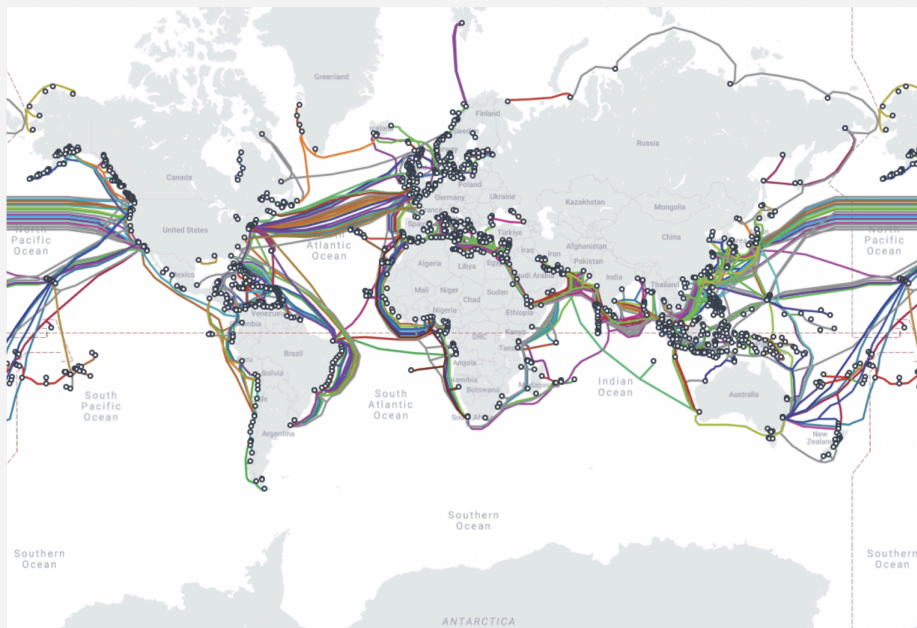


Figure 5. Map of submarine cables as of May 16, 2023. Source: TeleGeography's Submarine Cable Map.

B. Satellite networks

Satellite networks are “the linchpin of global communications, data transmission, and navigation systems. However, as these celestial networks expand, they become increasingly susceptible to a host of cyber threats”¹⁰⁸.

A security breach can impact security, paralyse critical infrastructure, and lead to financial losses amounting in the billions.

¹⁰⁷ In 2007, the Australian Communications and Media Authority declared three submarine cable protection zones in Australian waters over submarine cables of national significance (Northern Sydney, Southern Sydney and Perth). See also: Telecommunications Act 1997 - <https://www.acma.gov.au/rules-operating-around-submarine-cables>

¹⁰⁸ Graham N., *Securing Satellite Networks: An Exploration of Challenges and Next-Gen Solutions* (September 29, 2023), LinkedIn - <https://www.linkedin.com/pulse/securing-satellite-networks-exploration-challenges-next-gen-graham/>.

The security threats are far from abstract. Last year, the European Union Aviation Safety Agency (EASA) issued a Safety Information Bulletin to warn of intermittent Global Navigation Satellite Systems (GNSS) outages near Ukraine conflict areas (Paganini P., *EU and US Agencies warn that Russia could attack satellite communications networks* (March 20, 2022), Security Affairs - <https://securityaffairs.co/129243/cyber-warfare-2/russia-could-attack-satellite-communications.html>).

The U.S. Cybersecurity and Infrastructure Security Agency and the Federal Bureau of Investigation also published a joint advisory paper warning of possible threats to U.S. and international satellite communication (SATCOM) networks (*Strengthening Cybersecurity of SATCOM Network Providers and Customers* (May 10, 2022) - <https://securityaffairs.co/129243/cyber-warfare-2/russia-could-attack-satellite-communications.html>)

New Forms of Governance + Relational Approaches, Tools And Capabilities To Deal With Hyperobjects

The multilateral system is already failing to meet the governance needs for hyperobjects. This is because nation-state convening and programmatic direction from multilateral organisations can be:

① highly bureaucratic and too often siloed in terms of intersectional thematic areas and systemic risk; ② remote from the frontlines of issues and therefore unable to deal with the speed and scale of interconnected, cascading risks, or to meaningfully include and empower stakeholders and communities at the frontline; ③ often captured by more powerful, wealthy nation-states or private sector players who may be concerned with furthering or perpetuating their own interests; and ④ potentially costly in times of donor fatigue. New types of institutions are needed, as well as new forms of governance and relational approaches, tools and capabilities.

As risks around hyperobjects have already materialised, they shatter the overton window of present-day governance theory, opening new possibility-spaces for radically new systems on a planetary scale.

Expanded Notions of Agency, Sovereignty and Stewardship

A roundtable discussion facilitated by the Inclusive Governance Initiative at Chatham House concluded:

Imbalances that were built into the design of today's multilateral system continue to frustrate marginalized states. More fundamentally, global governance appears as a distant diplomatic exercise, serving states and global elites, but disconnected from the needs and priorities of its most numerous constituents: citizens and communities¹⁰⁹.

There are growing demographic changes (disenfranchised younger populations reside in some of the poorest parts of the world), as well as "the rise of South-South networks and geo-economic shifts more generally"¹¹⁰.

¹⁰⁹ Reflections on building more inclusive global governance: Ten insights into emerging practice (April 2021), Director's Office, Chatham House, the Royal Institute of International Affairs - <https://www.chathamhouse.org/2021/04/reflections-building-more-inclusive-global-governance/02-roundtable-perspectives>

¹¹⁰ Ibid.

With regard to anthropogenic climate change, the multilateral system is facing calls for much greater fairness and equity between nations, and recognition of historic responsibility in the form of the Loss and Damage movement¹¹¹. This has laid bare historic and current power asymmetries. As stated in Section 4 above, some critique has been articulated regarding the dominance of the Arctic coastal states in terms of the governance of that region. Furthermore, as more powerful and richer nations push to secure their national security objectives and pursue critical minerals supply chains or build planetary cables, satellite networks and other critical infrastructure, it is inevitable that further power asymmetries will emerge.

Given this potential context, a move towards greater internationalism (i.e. the principle of cooperation among nations for the promotion of their common good) might not suffice. Instead, far more egalitarian principles are required, as well as a framework that enables a defined role and more leadership capacities for a wider range of non-state actors in governance deliberations (e.g. sharing of geospatial data by private organisations).

One issue in terms of trying to secure wider inclusion is the risk of greater bureaucracy. International climate governance, for example, already attempts to convene multiple stakeholders at different levels. However, it becomes unwieldy and unable to move nimbly in times of crisis. It also seeks to shoe-horn non-state actors into patterns of governance that can be intimidating and are wholly alien to their environments or the context in which the solution would need to be elaborated. It is proposed that digital innovation and systems thinking should be embraced not just for greater inclusion, speed of consultation and problem-solving that tackles the complexity of planetary challenges, but also to help create entirely new forms of institutions, tools, processes and capabilities. Ultimately however, institutional structures may not be able to shift to more egalitarian values until a catalytic percentage of individuals themselves become self-regulating and relational in their outlook. This will require new learning and capacity building infrastructures.

Furthermore, the need to frame planetary governance around human coexistence with other beings on Earth will radically change perceptions of agency, legal standing and sovereignty. This is to be differentiated from a system based on property rights — so fundamental to liberal society — and a framework where territoriality defines the parameters of sovereign power.

¹¹¹ COP27 Reaches Breakthrough Agreement on New “Loss and Damage” Fund for Vulnerable Countries (November 20, 2022), UN Climate Press Release - <https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries>



A key question is how to move beyond bounded identity systems to relational inter-becomings?

To address hyperobjects that are common goods, there may be a need to shift towards a worldview of expanded agency, from self-sovereign nature to a degree of self-sovereign 'things'¹¹², where both humans and things possess inherent rights, agency and values. In this future, 'things' refer to entities and agents that are knots of various interconnected flows, whether information, resources, or energy, and which operate at the intersection of becoming and inter-becoming. It is worth noting that these concepts have been explored by several Indigenous, feminist and decolonial scholars, including Donna Haraway, Karen Barad, Elizabeth 'Dori' Tunstall, Rosi Braidotti, Adrienne Marie Brown and Faranak Miraftab. The question then becomes: how do we (re-)activate, enable and honour the existing practices, movements and knowledge that lend themselves to this Inquiry and the emerging research partnership's planetary mandate?

Whilst this area is in its nascent form, there are certain local landscapes where such entangled futures are being explored and manifesting. For example, the rights of nature and self-sovereign land movements have opened up domains for experimentation. A recent collaboration between Dm and the Scottish Land Commission explored options for different futures in land governance that could build pathways towards a new vision for relationships to land (which recognise land as unboundable and networked)¹¹³. One can begin to theorise about how certain hyperobjects could potentially be given self-sovereignty or stewardship mandates created in respect of others, which could then be layered with entirely new forms of governance. Clearly these landscapes have their own specific contexts and the concepts being explored would need to be tested at a much greater and complex scale for planetary challenges.

The concept of 'Rights of nature' is essentially a legal instrument that enables nature, wholly or partly, i.e. ecosystems or species, to have inherent rights to exist, thrive and regenerate. It allows for the defence of nature in court¹¹⁴. One critical aspect of rights of nature, as stated by environmental theorist Peter Burdon, is that legal rights are claims which place a duty on another individual or group. As he says, "Logically speaking the individual claim comes first and the

¹¹² It may not be advisable to consider self-sovereignty for all hyperobjects e.g. nuclear and biological weapons or computer or biological viruses, However, their governance could involve far greater stewardship with greater planetarity in mind.

¹¹³ *Land Governance Futures: Towards Common Relationships*, Dm and Scottish Land Commission (November 2023)

¹¹⁴ Nursimooloo K., *Rights of Nature, Rights of Rivers: Definitions and Declarations in the Movement* (January 21, 2023), Lawyers for Nature - <https://www.lawyersfornature.com/rights-of-nature/>



duty follows”¹¹⁵. The application of this legal concept to the environment is problematic as “it asks us to fragment an integrated system and impose artificial systems of competing interests”¹¹⁶. Most recently, in the United States, lawyers are using existing legal mechanisms to create ‘self-owned land’. Unlike rights of nature laws that require a legislature or court to recognise such rights, private landowners can introduce self-owning land language into conservation easements for their own land”. Thomas Linzey, a pioneering attorney for rights of nature, ‘community rights’ and ‘self-owned land’, explains this work:

What we did was borrow the rights of nature language and embed it into the land easement, so that a landowner could not just restrict use of the property, but actually recognize rights for ecosystems within that conservation easement¹¹⁷.

The concept of self-sovereign land/land that owns itself is based on a fundamental shift: from conceptualising nature as property to positing nature as a rights based entity in itself. This notion is also different to the commons, which refers to collective human ownership of the ecosystem. Self-sovereign land can help protect nature from humanity’s own worst instincts.

It is conceivable that any materialisation of the acute risks presented by hyperobjects may put regional countries on a collision course. The table below sets out the series of events that led to the creation of the Danube Commission, one of the oldest international organisations. It is an example of what could happen in the future and helps answer questions such as:

- ① How can competing regional actors move beyond competition and diplomatic aggression (or conflict) as a means to secure national security interests and instead recognise their mutual codependency?
- ② How can competing nations see that greater cooperation and mutual interest might secure their own national security in a more stable and sustainable way and also serve planetary security?

¹¹⁵ Burdon, P., *The Rights of Nature: Reconsidered* (2010), Australian Humanities Review. 49. DOI: 10.22459/AHR.49.2010.04

¹¹⁶ Ibid.

¹¹⁷ See: Bollier D., *Rights of Nature, Self-Owning Land, and Other Hacks on Western Law* (July 10, 2023), Resilience - <https://www.resilience.org/stories/2023-07-10/rights-of-nature-self-owning-land-and-other-hacks-on-western-law>.

For further listening on this area of emerging law and practice see the Frontiers of Commoning podcast by David Bollier and the interview with Thomas Linzey Thomas Linzey on Nature's Rights and Self-Owning Land (July 1, 2023) - <https://david-bollier.simplecast.com/episodes/thomas-linzey-on-natures-rights-and-self-owning-land> with a transcript available at: https://www.bollier.org/files/misc-file-upload/files/Thomas_Linzey_transcript_Episode_40.pdf.

Further reading: Garcia, D., *Global commons law: norms to safeguard the planet and humanity's heritage* (2021), *International Relations*, 35(3), 422-445. <https://doi.org/10.1177/004711782110360271>



The Danube River: Moving from Regional Competition to Transitional Cooperation

The Danube River is Europe's second longest river. Its drainage basin is approximately 817,000 square kilometres and the catchment area includes 18 countries and 83 million inhabitants - more than any transboundary basin in the world¹¹⁸.

Tamás Hardi wrote in an essay on the transnational "region-constituting role" of the Danube whereby in the 19th century, the Ottoman, Russian and Habsburg Empires pursued different interests in respect of Danube navigation¹¹⁹. National economies along the Danube became intense competitors with the river acting as a vital economic artery. The status of the maritime section of the river stood at the core of what became known as 'the Danube Question'. The anti-Russian alliance in the Crimean War (October 1853 to February 1856) of French, British, Ottoman and Sardinian troops aimed to remove Russia's exclusive control over the Maritime Danube¹²⁰ and "establish a system of security and predictability for commercial exchanges along a strategic waterway"¹²¹.

The allied powers' successful victory in the Crimean War led to the signing of the Treaty of Paris on March 18, 1856. This treaty not only ended the war but declared the Danube-Black Sea Delta as free and open to commercial vessels of all nations, and laid the foundations for the Danube Commission¹²². All signatories agreed that "internationalisation" was the "proper solution for turning the Danube into a stream of prosperity for the nations living along its banks and beyond them"¹²³.

The Danube River was the first transnational water treaty involving Western nations¹²⁴. The trade crisis that had erupted between

¹¹⁸ Website of the International Commission for the Protection of the Danube River (ICPDR): <https://www.icpdr.org/about-icpdr/framework/about-us>

¹¹⁹ Hardi T., *Danube Developments against the Backdrop of History and Geopolitics* (2012), Der Donauraum. 52. 10.7767/dnrm-2012-0225.

¹²⁰ Ardeleanu C., *The European Commission of the Danube, 1856-1948 - An Experiment in International Administration*, Balkan Studies Library, Volume: 27, Chapter 2, pp. 50-77 - <https://brill.com/display/book/9789004425965/BP000011.xml>

¹²¹ Ibid.

¹²² Gyurcsik I. (Ed.), *Danube Commission 70*, Institute for Foreign Affairs and Trade Budapest (2019) - https://www.danubecommission.org/uploads/doc/2019/Danube_Commission_70.pdf

¹²³ Ardeleanu C., *The European Commission of the Danube, 1856-1948 - An Experiment in International Administration*, Balkan Studies Library, Volume: 27, Chapter 2, pp. 50-77 - <https://brill.com/display/book/9789004425965/BP000011.xml>

¹²⁴ Note that the first international treaty was in the 3rd millennium B.C when the Mesopotamian cities of Umma and Lagas signed an international treaty to settle their conflict over the distribution of irrigation water - see Huszár Z., Várnagy P., Szederkényi E., *Divides or Connects? The Danube as an International Border and Watercourse in History*. <https://dj.univ-danubius.ro/index.php/AUDRI/article/view/44/259>

powers on the River Danube meant that there was an urgent need to orchestrate management of the river in a different way.



Figure 6. Image taken from Gerlak, A. K., Strengthening river basin institutions: The Global Environment Facility and the Danube River Basin (2004)¹²⁵

As with the Danube, the attritional impact of conflict, uncertainty, risk of mutually assured destruction and absorption of financial losses or costs (such as insurance) in respect of any hyperobject would force regional parties to the negotiation table. The only way then to avoid war and climate and/or other disaster might be to provide delegated authority to new types of quasi independent institutions that sit outside traditional public policy. In hyperobjects that present as common goods such as the Himalayas, these regions may become semi-autonomous zones and the role of these institutions may be seen as stewards on behalf of not only regional actors (with the use of external juries to provide informed engagement with impacted communities) but hyperobjects themselves (which begin to be seen as self-sovereign).

A Theory of Interface

The unique qualities of hyperobjects means they cannot be governed using traditional meta governance or global governance methods. They are transnational and hold mass multi-stakeholder cascading risks, liabilities and interactions. They are non-linear products, with non-linear outcomes, and require multiple

¹²⁵ Gerlak, A. K. *Strengthening river basin institutions: The Global Environment Facility and the Danube River Basin* (2004), *Water Resour. Res.*, 40, W08S08, doi:10.1029/2003WR002936.

interactions to operationalise and govern. They require a governance system that is regenerative, helps operationalise open commons systems (as opposed to closed or bounded common systems) and recognises plurality and interoperability between hyperobjects. A new theory of interface is needed to enable the articulation and shared sense-making between actants (between hyperobjects and with respect to humans and other non-humans) and different forms/applications of sovereignty. This moves beyond simply governance frameworks and towards relational and communications theory. As explored in Section 6 below, we would need to explore the role of agents and organising as a means to not only attempt to create a framework of governance for hyperobjects but capturing insights and learnings from hyperobjects and their interaction.

A theory of interface might be oriented around:

- ◆ Collection and application of data and AI and ML tools;
- ◆ Embedding of the social technologies of presencing, sense-making and of listening;
- ◆ The creation and maintenance of trust/faith in the process as a key requisite for effective public discourse. However, in a society of scarcity, separation, and powerlessness, trust itself can be a scarce commodity. Therefore, this will be dependent on a size-able percentage of individuals pivoting to a more relational outlook based on mutual reliance and reciprocity and common risk and duty.

Exploring futures based on machine assisted extrapolations of 'rights of nature' could help achieve planetary governance that incorporates socio-ecological systems. This might include self-governing systems that are focused on drawing insights and learning as a means of continuous coherence (as opposed to control and rule systems) and mass participatory systems that are able to govern equitably and transparently and that can build shared consciousness.

Furthermore, a new thesis may be needed of how to build treaties and govern them. According to Thomas McInerney, Executive Director of the Rule of Law for Development Program at Loyola University Chicago School of Law, the era of big data and the use of individual technologies in combination¹²⁶ may enable what he terms as "intelligent treaty systems" and get close to delivering near

¹²⁶ For example remote sensing and Earth observation (EO) satellites, cloud computing, artificial intelligence (AI), machine learning (ML), and modelling and visualisation tools.



real-time, planetary and more precise knowledge than ever¹²⁷. Planetary-scale computation can also provide a means to “sense, model and recursively act back upon the planet from which it emerges and in which it is situated”¹²⁸. It can be something through which governance can act and through which collective intelligence can emerge.

It is hoped that a new class of transnational ‘treaties’ could structurally move:

- ◆ Beyond commons preservation strategies to investable commons restoration and regeneration;
- ◆ Beyond consultation to embrace participatory design and coding;
- ◆ Beyond analogue treaties to embrace a framework of smart treaties which can support real-time verification, dynamic machine learning based impact models, parametric and contingent decision spaces and with auto-verification and quasi fiscal mechanisms; and
- ◆ Beyond discipline-specific silos of problem solving and create collaborative sponsorship, investment, involvement, and participation of sectors to steward the way forward.

Mass Multi-Actor Participation as a Theory of Legitimacy

As stated by Bratton:

The challenges of planetarity shift the project of governance at its core. Instead of mediation of popular voice, it rotates toward the administration and allocation of viable ecosystems, inclusive of human societies and their myriad entanglements and semiotics¹²⁹.

The governance of hyperobjects requires radical new forms of participatory engagement and models of alliance building. These need to be based on mass-multitude, multi-actor governance models, rather than single governance models. This form of governance also recognises that multiple publics coexist and hence shifts the focus to the formation of public goods through the interaction of diverse groups and interests. Such governance is needed to help develop coherence in a society that needs to be

¹²⁷ McInerney T., *Technology is transforming global treaties* (November 8, 2021), TechCrunch Global Affairs Project, TechCrunch - <https://techcrunch.com/2021/11/08/technology-is-transforming-global-treaties/>

¹²⁸ Bratton B., *New World Order for Planetary Governance*, Strelka Mag (May 27, 2021) - <https://strelkamag.com/en/article/new-world-order-for-planetary-governance>

¹²⁹ Ibid.

driven by insights and learning¹³⁰ instead of control, with new methods of collective reasoning and self-organisation and where [planetary beings] evolve through continuous learning in feedback rather than through rigid structures:

Societies must have the ability to not simply produce and consume mindlessly but to deliberately compose themselves. If societies are able to sense themselves, model themselves, and act back upon themselves, then this also means recognizing that society is planetary and has been so long before Modernity. If we're going to construct the basis of a twenty-second century worth living through, our capacity for self-composition must be the subject of our most intense imagination and reason¹³¹.

Legitimacy can be constructed through mass multi-actor participation and radical legibility of decision-making - both made possible through planetary scale computation:

Mass multi-actor participation — In this paradigm, legitimacy is not dependent on democratic voting processes but can be created by any tool that can harness collective wisdom. As stated by Jennifer Rietbergen-McCracken at the Commons Social Change Library¹³², this might include: (a) Citizen juries and consensus conferences (to involve stakeholders who are not policy experts); (b) Working groups and commissions (to include expert publics); (c) "Participatory vision and scenario development, citizens' forums and dialogue processes", as well as partnerships and alliances which then feed back into dialogue processes (to promote broader public engagement)¹³³; and (d) new frameworks of organising such as [10x100](#) that support large scale assisted intelligence learning oriented coordination.

- ◆ In terms of countries that are not democracies, dialogic systems exist, as well as other forms of legitimacy structures that are different to democracies e.g. the Majlis-ash-Shura or Consultative Council in the Arab world and China's Residents' Committees;
- ◆ Processes would need to be in place to ensure that asymmetric power, gender imbalance and societal marginalisation of certain groups does not skew participatory engagement;

¹³⁰ We are seeing innovation and investment in the sensing aspects of communities e.g. Digital Democracy's Mapeo tool, Terasso, and similar community-co-created software approaches

¹³¹ Ibid.

¹³² (a) to (c) of this list is taken from examples of active participation tools in Rietbergen-McCracken J., Participatory Policy Making, Civicus, The Commons Social Change Library - <https://commonslibrary.org/participatory-policy-making/>

¹³³ Ibid.

Radical legibility of decision-making — Kevin Lynch, a renowned urban planner, has defined 'legibility' as "something that a complex environment offers to its inhabitants, allowing them to easily navigate it. It is a clarifying abstraction, making the world more than an endless deluge of minute details"¹³⁴. However, it has also been criticised as over-simplification of the "complex, multifaceted nature of real life into a data point. The measures are a pauperised, context-free, superficial substitute for reality"¹³⁵. What is needed is something far more meaningful and radical to shift our approach to "what we measure, how we measure and why we measure"¹³⁶. The following classification has been provided by Thea Snow, Director of the Centre for Public Impact in Australia and New Zealand:

- ◆ What we measure and how to capture and incorporate different forms of information such as "quantitative data, [stories](#), [emotions](#), [world models](#) and [relationships](#)". Attention needs to be paid to what data is missing and which voices are absent? What are the untested assumptions and do they obscure other realities?
- ◆ How we measure dynamically e.g. evaluating programmes in real time, keeping on top of changes and being responsive to that, and ensuring the transparency of audits;
- ◆ Why we measure - moving from control to insights and learning about complexity and the issues facing people in order to improve the allocation of decision-making.

Moreover, a shift is needed towards ennoblement systems that aim to empower individuals and communities to make better, more informed decisions. The role of governance is not just about regulating and controlling decisions but also about drawing insights and validating the integrity of learning and feedback loops, informational networks, and social recognition systems. This shift impacts policy-making and redefines the role of politics, moving from simple decision-making to ensuring the integrity of the learning process.

According to philosopher, anthropologist and sociologist Bruno Latour, the main problem with climate change was a "crisis of representation" and feeling of powerlessness because of "the total

¹³⁴ Lynch K., *The Image of the City* (1960), MIT Press; cited in Tellmen Z., *Two concepts of legibility* (2020) - <https://ideolalia.com/essays/two-concepts-of-legibility.html#:~:text=Scott%20defines%20%E2%80%9Clegibility%E2%80%9D%20as%20something,forget%20those%20differences%20ever%20existed.>

¹³⁵ Lowe T., *Made to Measure: how measurement can improve social interventions* (June 1, 2020), Medium - <https://medium.com/centre-for-public-impact/made-to-measure-how-measurement-can-improve-social-interventions-2212a6ed6138>

¹³⁶ Snow T., *The (il)logic of legibility – Why governments should stop simplifying complex systems* (February 12, 2021), LSE Blogs - <https://blogs.lse.ac.uk/impactofsocialsciences/2021/02/12/the-illogic-of-legibility-why-governments-should-stop-simplifying-complex-systems/>



disconnect between the range, nature, and scale of the phenomena and the set of emotions, habits of thoughts, and feelings that would be necessary to handle those crises"¹³⁷. Latour argued for the inclusion of non-humans in the idea of the body politic, and which encompassed 'Gaia' i.e. "the complex networks of relations that sustain life on Earth"¹³⁸. Latour was a proponent of the Actor-Network-Theory ("ANT") that sets out a relational approach that conceives of space as "constituted through the networks of people, organisations, objects, ideas, and texts" that shape practice¹³⁹. Latour proposed a politics that was propelled less by ideology¹⁴⁰ and more by engagement and dialogue¹⁴¹.

Mass multi-actor participatory engagement is essential to the effectiveness of hyperobjects governance systems. As Morton wrote in 'Dark Ecology', a spirituality of care needs to be created with hyperobjects, however frightening they may be¹⁴². Indeed, it is learning to grapple with feelings such as fear, sadness, powerlessness and confusion that might help humans navigate climate change. Morgan Meis has written that:

At a minimum, Morton thinks that this kind of caring could cure us of the idea that we are in control; it might show us that we are part of a vast network of interpenetrating entities that come to know one another without dispelling their mystery. At a maximum, Morton seems to feel that this omnidirectional, uncanny form of care could help save the world.¹⁴³

In this regard, we can also invoke Mbembe's *The Earthly Community* or *La communauté terrestre*: the obligation of resonance with the living world that permeates human existence consists of "making room for the Other, of embracing that which is unexpected", unknown and unforeseeable¹⁴⁴.

¹³⁷ Latour B., *Waiting for Gaia: Composing the common world through art and politics* (2011), Launch of the Sciences Po Program in Arts and Politics (SPEAP), Paris, France; Available at: <http://www.bruno-latour.fr/node/446>; cited in Boulton E., *Climate change as a 'hyperobject': a critical review of Timothy Morton's reframing narrative: Climate change as a hyperobject*, Wiley Interdisciplinary Reviews: Climate Change. 7. 10.1002/wcc.410 (2016)

¹³⁸ The concept of Gaia was coined by chemist and inventor James E. Lovelock and biologist Lynn Margulis in the 1970s. See also Boston P.J., *Gaia Hypothesis*, Encyclopedia of Ecology (Second Edition), 2008, cited in Science Direct - <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/gaia-hypothesis>

¹³⁹ Faik I., Thompson M. and Walsham G., *Facing the Dilemmas of Development: Understanding Development Action through Actor-Network Theory, Actor-Network Theory for Development - Working Paper Series, Paper No. 2, (2013), p. 21 -* https://hummedia.manchester.ac.uk/institutes/cdi/resources/cdi_ant4d/ANT4DWorkingPaper2FaikEtAl.pdf

¹⁴⁰ "beyond the modernist ontology of nature/culture, beyond 'truth' and 'power' politics, and beyond the left/right spectrum", Harman G., Bruno Latour: Reassembling the Political, Theory, Culture & Society, Global Public Life - <https://www.theoryculturesociety.org/blog/review-graham-harman-bruno-latour-reassembling-the-political>

¹⁴¹ Latour B., Milstein D., Marrero-Guillamón I. and Rodríguez-Giralt I., *Down to earth social movements: an interview with Bruno Latour* (2018), Social Movement Studies - <https://doi.org/10.1080/14742837.2018.1459298> and <https://sociology.columbia.edu/sites/default/files/content/P-185-SOCIAL-MOVEMENTS-18.pdf>

¹⁴² Meis M., *Timothy Morton's Hyper-Pandemic* (June 8, 2021), New Yorker - <https://www.newyorker.com/culture/persons-of-interest/timothy-mortons-hyper-pandemic>

¹⁴³ Ibid.

¹⁴⁴ Mbembe A., *The Earthly Community*, Coloniality of Infrastructure (October 2021), e-flux Architecture - <https://www.e-flux.com/architecture/coloniality-infrastructure/410015/the-earthly-community/>



Finally, models of alliance building may need to be developed that are less about top down approaches but rather, assess capacity based on the network of organisations that actors can deploy, including the “capillary connections that link to seemingly micro actors”¹⁴⁵.

Commons as Generative Systems

The global commons has been described as providing “a new language, a new vocabulary to counter the ruling neoliberal, capitalist paradigm. According to this frame, commons language allows us to move beyond the current private/public dichotomy, by presenting alternatives which are neither market-based (private) nor government-controlled (public)”¹⁴⁶. However, Alexandre Kiss, a scholar and activist in the field of environmental law, has stated that whilst commons themselves might be *res communis*, the resources are not and therefore can be appropriated¹⁴⁷. Global commons law is still founded on a consumptive relationship.

The question then is how do we move from a theory of commons largely through a lens of static, divisional rights (i.e. rights to exploit) to commons as generative systems in their own right, to be managed and constructed in different formats?

New forms of governance may need to be based on stewardship and collective ownership grounded on principles of reciprocity and mutuality. Given the pace and gravity of planetary challenges, caring for key global commons and shifting their state from degeneration to restoration and regeneration implies a focus on new designs of our decision-making apparatus.

Computational bureaucracy will be needed in order to orchestrate this work to create a new class of institutions to develop and embed sensor capabilities, new decision making structures and new innovation capacity. It might include for example new value metrics,

¹⁴⁵ Faik I., Thompson M., Walsham G., *Facing the Dilemmas of Development: Understanding Development Action through Actor-Network Theory, Actor-Network Theory for Development - Working Paper Series, Paper No. 2, (2013), p. 28*
https://hummedia.manchester.ac.uk/institutes/cdi/resources/cdi_ant4d/ANT4DWorkingPaper2FaikEtAl.pdf

¹⁴⁶ Bollier D., *The Growth of the Commons Paradigm* in Hess C. and Ostrom E. (eds), *Understanding knowledge as a commons: from theory to practice*, MIT Press (2007) 28, cited in <https://ghum.kuleuven.be/ggs/events/2016/international-conference-global-commons-global-public-goods-and-global-democracy-leuven/c-cogolati-and-vanstappen-global-commons-and.pdf>

¹⁴⁷ Kiss A., *The Common Heritage of Mankind: Utopia or Reality?* (1985) 40 *International Journal* 423, cited: <https://ghum.kuleuven.be/ggs/events/2016/international-conference-global-commons-global-public-goods-and-global-democracy-leuven/c-cogolati-and-vanstappen-global-commons-and.pdf>



institutional decision-making frameworks, smart engagement mechanisms embedded into new forms of treaty making, information flows and access to data, investment frameworks, incentives and safeguards.

The future of governance will increasingly rely on the coordination of large-scale systems, involving both human and non-human agents. Assisted intelligence frameworks will play a pivotal role in this, enabling generative intelligence to support the learning and reflexive capacity of such agents. We also need to move towards a model of smart intermediated governance, leveraging intermediaries as smart agents of public good. This would signify a profound change in the realm of computational bureaucracy.

Moreover, new forms of financial institutions and mechanisms will be required for hyperobjects. However, these will need to be structured so as to avoid rent seeking and colonisation practices within the system.

There is a need for responsibly empowered actors to invest in building collective agreement spaces, institutions and regenerative facilities.

A New Pedagogic Framework

A key challenge that the Inquiry aims to tackle is how to build the capacity to deal with crises and new innovation capacity to deal with new types of hyperobjects in new formats.

It is to be noted that the work in this space is not only academically uncharted but practitioner uncharted. The challenge is to seed an experimental space to be able to drive into possibilities spaces to build hybrid, polymathic skills and then form insights and learning frameworks around them, as well as new forms of disciplines and capabilities. We propose that such a new pedagogic framework may entail a two stage process:

A. Action-Based Learning Networks In-Situ in Different Landscapes

One of the reasons why the Inquiry is setting up a research partnership is to build the partnerships, landscapes, and sector specific and inter-disciplinary networks to be able to set out a new, ambitious framework for thriving planetary futures.

In respect of each hyperobject, the Inquiry takes a particular crisis management approach by seeking to ascertain how to build capacity and capabilities in adjacent possible landscapes to the hyperobject in question that is at risk of potential failure.

Rather than focus on the site of the hyperobject itself, work may be undertaken in adjacent possible landscapes with less impediments because there the hyperobject presents as a lower threshold problem. The next question becomes how to start building experimental pathways that enable cross-over and application back to the primary hyperobject itself? For example, if the Himalayas are going to be affected, how can experimental pathways be tested in adjacent possible landscapes e.g. the Alps (which has a level of governance coordination via the Alpine Convention) and which can be constructed for cross-over application?

B. Action-Based Learning is Built Backwards into New Research and Learning Structures that are Problem-Based to Create:

- ① new hybrid practitioners
- ② new planetary capabilities.

The governance of hyperobjects requires hybrid problematic practitioners: designers at the level of geography; lawyers; new forms of multi-stakeholder diplomacy models; new forms of planetary financing mechanisms; and new forms of institutional design

It requires not just novel individual capabilities but a new hybridity of capabilities.

Jon Soske of RISD has set out an 'Unbound Agents Model' which can be used as a starting point to articulate the mechanics of hybrid practitioners¹⁴⁸. Soske talks about designing for complexity with both 'model-bound agents' (that act within a certain system and are guided by its rules, structures and norms) and 'unbound agents' (that are able to manage complexity as they operate at the edge of systems) in mind. Each agent operates according to their own reality. In terms of unbound agents, as they sit outside (or across) defined structures and notwithstanding potential for maladaptive or nefarious intent, they can better interrogate and understand the

¹⁴⁸ Soske J., *Agents and Institutions*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/Agents-and-Institutions>

system from the outside-in (i.e. differently to those inside certain structures running them).

Soske divides unbound agents into three categories:

- ① **Chaos Agents** that exploit the frameworks that guide model-bound agents;
- ② **Hackers** who understand the underlying technical infrastructure of an institution and exploit it to serve their own ends; and
- ③ **Reflexive agents** who analyse institutional dynamics in real-time and transform this into actionable insights.

He also interrogates the context in which agents operate - moving from the predictability of 'small world' environments to embracing 'large world' environments where you encounter 'large world events'¹⁴⁹ where there is "unpredictability, complexity, the absence of clear patterns, and the lack of affordances for learning"¹⁵⁰. This type of approach might need to be adopted for a new theory of organising as well as new governance frameworks for hyperobjects. In other words, we might need to shift agent behaviour as well as tackling system parameters.

Far from humanity being helpless in the face of largeness, applying the idea of bound and unbound agents nomenclature can help us navigate uncertainty. Indeed, unbound agents will be particularly invaluable here: "Unbound agents are often deeply embedded in communities at the periphery of institutional landscapes and from the limits of institutions - and in the spaces of their breakdown and failures - they traverse, critique, troubleshoot, and find ways to improve"¹⁵¹. We can enhance our understanding of how individuals, communities, and institutions interact, adapt, and evolve in different contexts, and design institutions to better reflect the connections that shape our planet.

However, moving from a small world view to being more comfortable with large world uncertainty will require new forms of polycentric decision-making, relational theory and ideology. As one potential coordination mechanism, Charlene Sequeira at RISD has explored the idea of protocols that "allow for complex, interdependent,

¹⁴⁹ Soske talks of three types of largeness: (a) Spatial or information incompressibility (where we lack time or computational resources to solve a problem or it appears unsolvable); (b) Temporal or dynamic incompressibility when contexts change at a pace that prevents learning; and (c) Human learning and strategic behaviour itself creates largeness. See Soske J., *Small Worlds and Large Worlds*

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

emergent, multi-stakeholder coordination across time and place¹⁵². She has considered certain pressure tests:

Speed and Scale:

- ◆ What embedded power structures are conceding to small world views?
- ◆ How can we identify pathways of agency and action that can help us evolve at the pace of the age of emergence?
- ◆ How can protocols be transformed into generative-value lead action at speeds and scales that match the age of emergence?

Language and Learning:

- ◆ How do we design legible protocols within systems?
- ◆ How do we co-create new language for planetary futures around a “decentralized peer-to-peer learning structure that is not only based on trust and ethics, but a vibrant sense of imagination and experimentation¹⁵³?
- ◆ Adding to Sequeira’s points, how do we capture insights as well as learnings?

Expanded Ecological Ethics and Large-World Views:

- ◆ How do we capture non-human feedback loops that do not conform to our human-centred models?
- ◆ Adding to Sequeira’s points, how do we embody a new theory of interface between actants?

Hospicing Power Structures to Stewardship:

- ◆ How do we build healing and stewardship?

Plurality and Complexity:

- ◆ How can protocols generate decentralised and self-governing value cycles and which consider a plurality of “cultural, epistemological, and ecological perspectives¹⁵⁴?

¹⁵² Sequeira C., *Getting Started*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/Using-Protocols-Getting-Started>.

¹⁵³ Sequeira C., *Using Protocols - Considerations*, Planetary Perspective series, Draft Design Manual for the Polycene, Center for Complexity, RISD - <https://polycene.design/Using-Protocols-Considerations>

¹⁵⁴ Ibid.



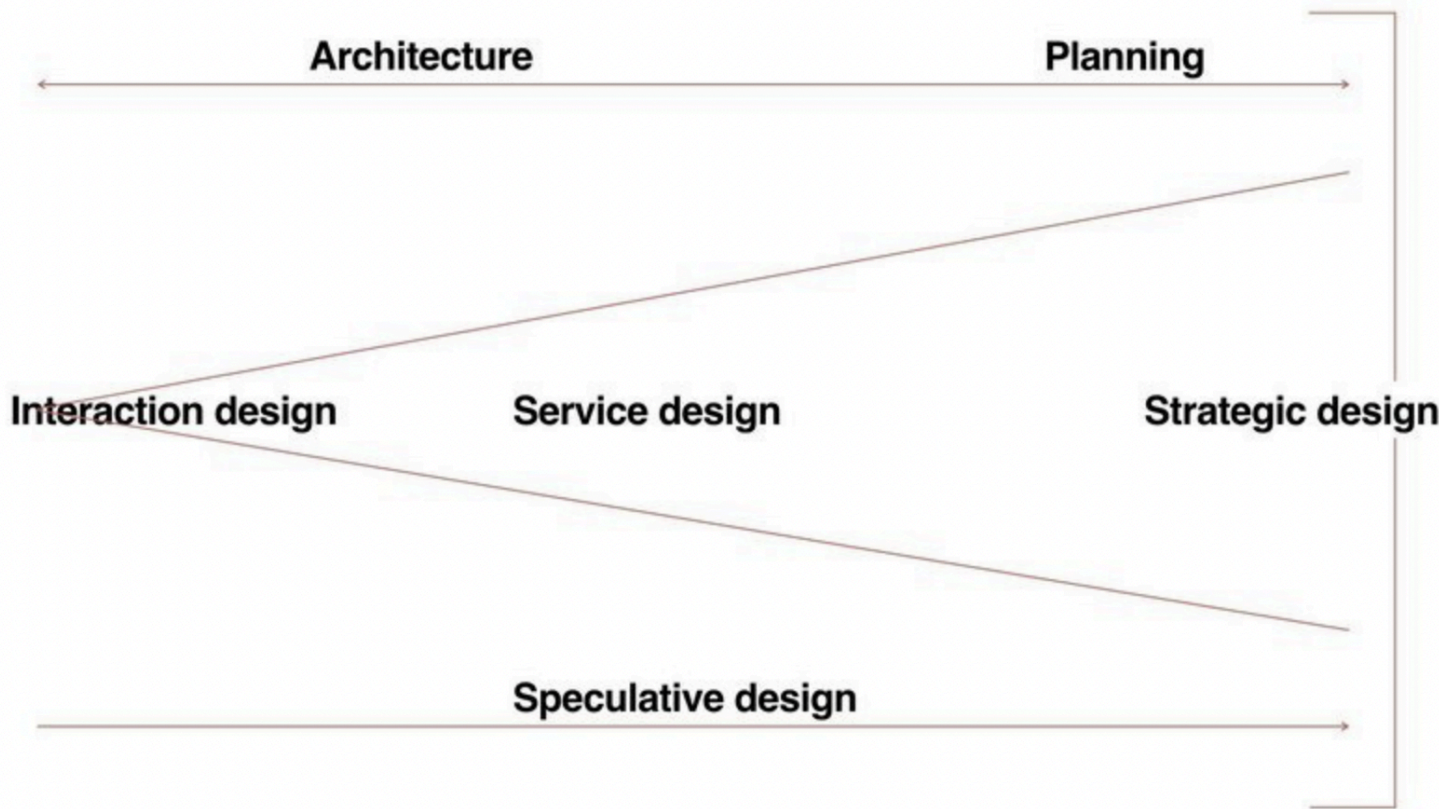


Figure 7. Scales of design. Diagram by Dan Hill¹⁵⁵

The Inquiry is scoping the set up of a series of research design studios¹⁵⁶. Here, strategic design will play an assemblage function. It will enable different disciplines to come together in order to open up and interrogate the planetary and host the synthesis of exploration across multiple disciplines. As Dan Hill notes: “design’s role is often orchestrator, organiser, facilitator, and integrator, rather than the master builder (sic) often imagined. Design’s ability to juggle detail and direction simultaneously means it is suited to these balancing acts, producing coherent systems and services from highly diverse inputs, wrangling multiple scales and timeframes”¹⁵⁷

Central to our pedagogic framework will be the organising of knowledge at problem domains e.g. common goods with planetary stakes and impacts such as The Himalayas, rather than through specific disciplines. A further question therefore will be to assess how existing disciplines can fold into action/research/learning structures that are problem based to create new hybrid practitioners

¹⁵⁵ Hill D., *The city is my homescreen* (February 2, 2019), Medium - <https://medium.com/dark-matter-and-trojan-horses/the-city-is-my-homescreen-317673e0f57a>; cited by Humble J., *What is Strategic Design?* (April 7, 2020), the Fountain Institute - <https://www.thefountaininstitute.com/blog/what-is-strategic-design>

¹⁵⁶ A further paper will set out our proposed pedagogic framework in greater detail.

¹⁵⁷ Hill D., *Strategic design for public purpose* (March 8, 2019), UCL IIPP Blog - <https://medium.com/iipp-blog/strategic-design-for-public-purpose-33c3899dba5e>

or capabilities. For example, how do we expand urban design and landscape-level design into adjacent pathways and towards planetary scale design? How do communication and media designers learn to develop the interfaces for new approaches to ownership, treaty-making and governance?

Organising such problem domains will centre practitioners into problem spaces. A new action/research/learning orientation and knowledge facilitation economy may be required as the capabilities and the hybridity of the new knowledge that is needed do not yet exist. Practitioners might be given action-based professorships working across multiple projects to build knowledge. The aim would be to inculcate active learning communities that document their practice knowledge, are auto-reflective, share open documentation and critical analysis, and follow peer review models.

To facilitate the synthesis and construction of knowledge into new pedagogical frameworks, this learning orientation could be turned into Executive MBAs, PhDs and 1 year MPhil degrees for different problem domains. The courses might be held and taught in research design studio type environments at universities but would be working at the executive domain downward. These courses would then drive down into next gen bachelors and masters programmes.

It is important to recognise that this is an unknown space in terms of building the action learning frames for hybrid problem-based practitioners. A key question is how to build new action learning networks in periods of crisis through a practitioner lens? Some examples have been provided in disaster relief situations¹⁵⁸. Finally, such a learning orientation requires craft based learning (i.e. practitioner frameworks) and abstract based learning (i.e. meta learning across experiments for assessment of patterns in the group) to work together.

¹⁵⁸ See *How to develop the anticipatory action framework*, OCHA - <https://anticipatory-action-toolkit.unocha.org/framework/>



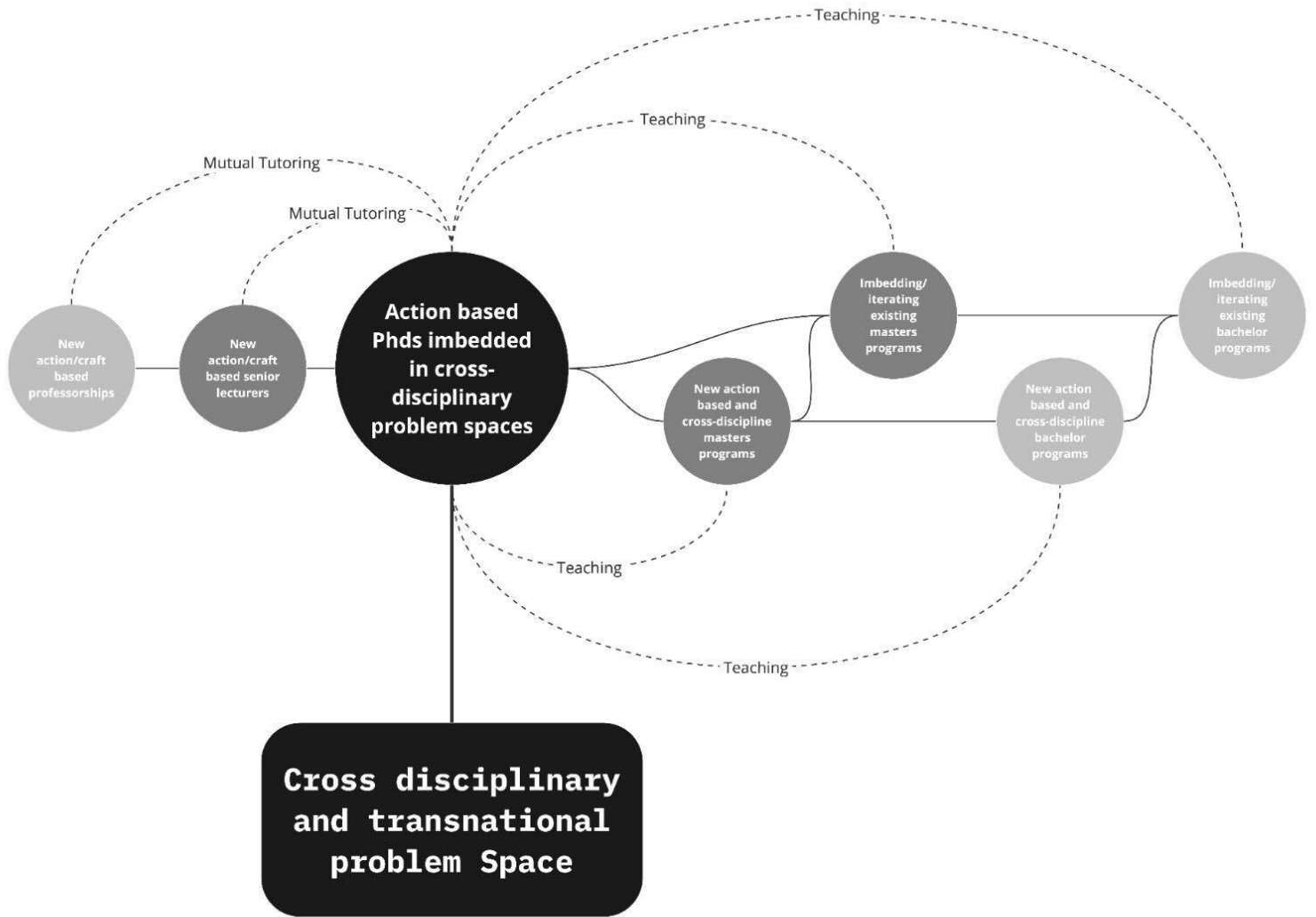


Figure 8. Action based PhDs in cross-disciplinary problem spaces. Diagram by Dm.

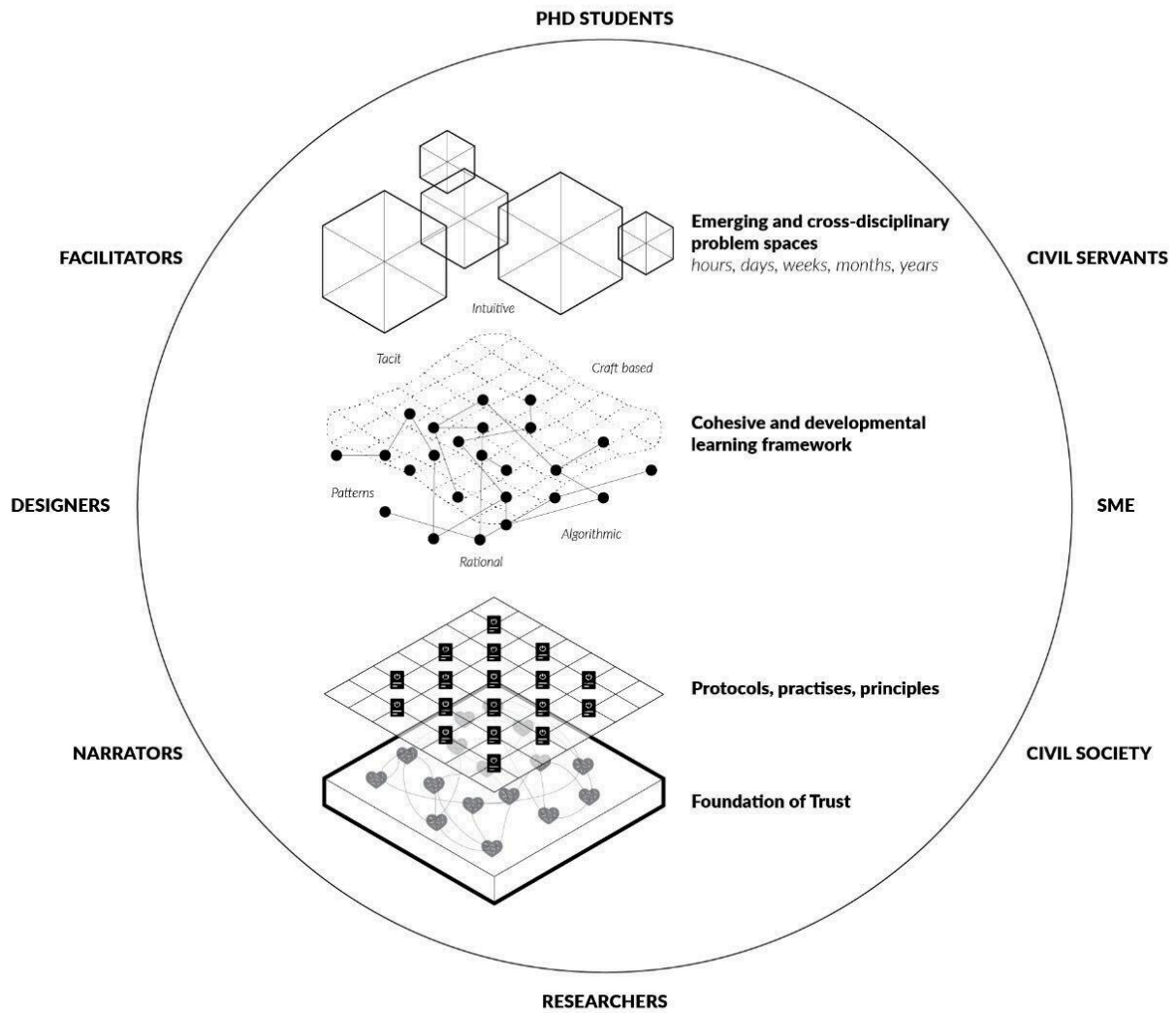


Figure 9. A potential ecosystem for innovation laboratories to support action based PhDs in cross-disciplinary problem spaces. Diagram by Dm.

COHESIVE AND DEVELOPMENTAL LEARNING FRAMEWORK

v.1 2023-10.18 Indy Johar and Linnéa Rönnquist

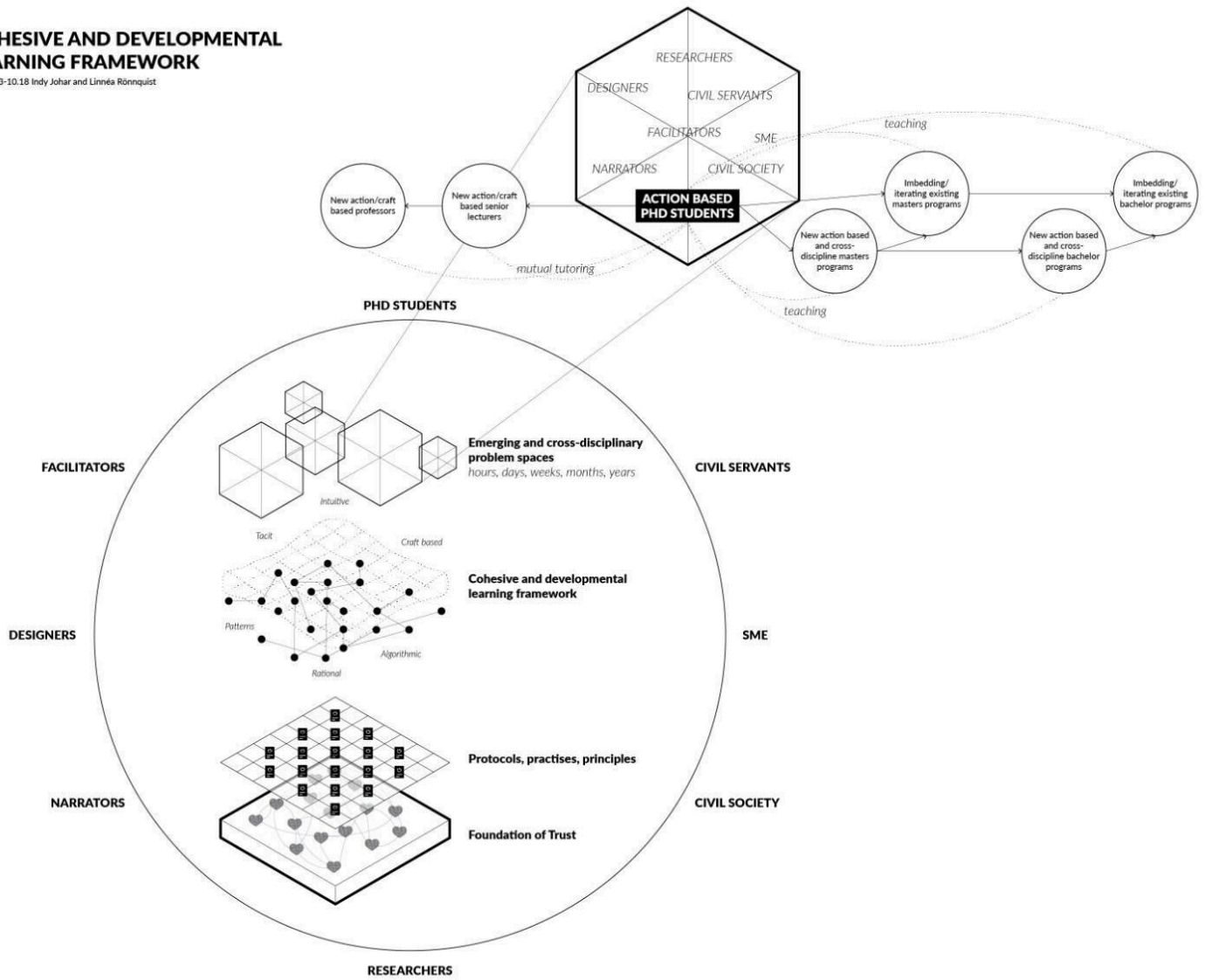


Figure 9. An emerging theory of change for innovation laboratories to support action based PhDs in cross-disciplinary problem spaces. Diagram by Dm.

A Way Forward

We are at a pivotal moment in time. The scale of the planetary challenges in front of us has meant that there is a collective consciousness that we cannot continue with the status quo. Key stakeholders and communities understand that urgent, collective action is needed to restore and protect our failing human and ecological systems. It is within our power to work together to build a better world for people and the planet. There is a need for renewed systems of care and healing in response to unprecedented alienation and we need to take protective measures to support the marginalised, the more than human and all existing and future life on Earth¹⁵⁹.

We can draw inspiration from concepts such as the Seventh Generation Principle based on an ancient Haudenosaunee (Iroquois) philosophy¹⁶⁰ that the decisions we make today should result in a sustainable world seven generations into the future. Rather than place an undue pressure on ourselves, in a time of uncertainty, we can take comfort in the fact that we are part of a long continuum of communities, both human and non-human, who have left a mark on this Earth and whose actions - each of them - matter. It should encourage us to responsibly consider the impacts of our actions, each of which become part of a collective whole spread through time and space. Rather than make us feel powerless faced by the enormity of the scale and scope of planetary challenges, it should help us to see our place in that continuum, and build a sense of "purpose, community, and belonging"¹⁶¹.

We welcome you to add to the exploration of ideas contained in this Position Paper and to consider a further conversation with us on how best to curate a research partnership to help navigate pathways for thriving planetary futures and also where you might see your role within this community.

¹⁵⁹ For further reading see: Steffan A., *We're not yet ready for what's already happened*, The Snap Forward by Alex Steffan - <https://alexsteffen.substack.com/p/were-not-yet-ready-for-whats-already>. He talks of a "discontinuity", a watershed moment

¹⁶⁰ Akers C., Seven Generation Thinking, EcoResolution - <https://www.ecoresolution.earth/resources/seven-generation-thinking>

¹⁶¹ Ibid.