



What Is a Global Polycrisis?

And how is it different from a systemic risk?

Michael Lawrence, Scott Janzwood, and Thomas Homer-Dixon

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Authors:

Dr. Michael Lawrence is a Post-Doctoral Researcher at the Cascade Institute. His work concerns the role of violence and conflict in transformations of world order and applications of complexity thinking in the social sciences. He holds a PhD in Global Governance from the University of Waterloo.

Dr. Scott Janzwood is the Research Director at the Cascade Institute. His research focuses on how scientists measure and communicate uncertainty and collaborate with policy makers to address emerging risks. He holds a PhD in Global Governance from the University of Waterloo.

Dr. Thomas Homer-Dixon is the Founder and Director of the Cascade Institute. Trained in international relations and conflict theory at the Massachusetts Institute of Technology, his research focuses on threats to global security in the 21st century, including economic instability, climate change, and energy scarcity.

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Summary

This discussion paper argues that the concept of “global polycrisis” provides a necessary and productive framework with which to understand and address major problems afflicting humanity today. A global polycrisis occurs when crises in multiple global systems become causally entangled in ways that significantly degrade humanity’s prospects. The paper elaborates several important features of this definition, compares it to other authors’ use of the term, and distinguishes it from the related concept of systemic risk.

1. Defining global polycrisis

The last few decades have made plain that global systems—from finance to security to energy—are highly susceptible to systemic risk. The dense interconnectivity of these systems enables a relatively small problem in one part of the system to spread rapidly and disable the entire system, as when defaults in the US subprime housing market spiraled into the Global Financial Crisis of 2007-2009; or when a few tree branches touching powerlines in Ohio triggered electrical blackouts across the northeast US and parts of Canada for several days in 2003; or more recently when the grounding of a single ship in the Suez Canal disrupted supply chains worldwide.

As the COVID-19 pandemic and Russia’s invasion of Ukraine have demonstrated, systemic risks do not remain confined to the global systems in which they originate. Putin’s aggression, for example, has disrupted global food and energy systems, reinvigorated the NATO alliance, exacerbated domestic ideological cleavages in many countries, and threatens to divert international resources from climate action. What may appear to be separate crises in different global systems in fact interact, exacerbate, and reshape one another to form a conjoined “polycrisis” that must be understood and addressed as a whole.

The causal linkages by which one global crisis triggers or exacerbates another represent a growing danger to humanity. Several institutions concerned with global risk have highlighted such connections as a critical gap in our knowledge that requires urgent attention (see Box 1). Established concepts, such as “systemic risk” (Renn 2016; Renn et al. 2019), “catastrophic risk” (Bostrom and Ćirković 2008), or “existential risk” (Ord 2020) do not adequately highlight these crisis interactions, even though they do capture essential aspects of the phenomenon. We propose the concept of global polycrisis as an overarching framework with which to investigate the causal connections of crises across global systems, and define it as follows:

A global polycrisis occurs when crises in multiple global systems become causally entangled in ways that significantly degrade humanity’s prospects. These interacting crises produce harms greater than the sum of those the crises would produce in isolation, were their host systems not so deeply interconnected.

The core concern of the concept is that a crisis in one global system has knock-on effects that cascade (or spill over) into other global systems, creating or worsening crises there. Global crises happen less and less in isolation; they interact with one another so that one crisis makes a second more likely and deepens their overall harms. The polycrisis concept thus highlights *the causal interaction of crises across global systems*. This definition has several key features:

From risks to crises: Risks represent inter-subjective cognitive states about the *possibility* that harms will occur in the future (Holton 2004). When this potential is causally activated into *actual* harms, it may constitute a crisis. A crisis involves a sudden (non-linear) event or series of events that significantly harm, in a relatively short period of time, the well-being of a large number of people (T. Homer-Dixon et al. 2015). By this definition, the Cuban Missile Crisis was not truly a crisis but instead created an acute *risk* of a crisis (nuclear war) that was thankfully averted. As discussed further below, a polycrisis stems from the activation of a particular kind of risk—systemic risk—by which a small problem quickly spreads throughout a system and often into other systems.

Emergent harms: The polycrisis concept highlights the *causal entanglement* of crises in multiple global systems. When complex systems grow deeply interconnected with one another, the resulting behaviors (including their impacts on people) are different than the sum of the effects they would have separately, absent such interdependence. The combined harms of crises in multiple global systems are not simply additive; the interaction changes their collective effects. The dynamics and impacts of the combined crises (i.e., the polycrisis) are emergent. These interactions could, in theory,

Box 1: The urgent need for polycrisis research

A number of organizations concerned with global risk have called for deeper analysis of the causal interactions between global crises. Future Earth's *Global Risk Perceptions Report 2021* polled scientists from around the world to assess 35 global risks and came to a significant conclusion (p. 17):

An important consideration with regards to global risks is understanding how they interact with one another. Risks do not occur in isolation. They can have compounding effects that amplify the impacts when two or more risks co-occur and they can also have cascading impacts, where the likelihood of further risks occurring increases once one particular risk manifests, creating a domino effect. Understanding the interconnections between global risks – including building awareness of interdependencies and feedback loops – and which groupings of risk present the greatest threats, is thus a key part of improving risk assessment and discussing potential solutions, since strong interconnections need to be taken into account in mitigation planning.

Similarly, a recent briefing note on systemic risk by the International Science Council, United Nations Office for Disaster Risk Reduction, and Risk Knowledge Action Network (Sillmann et al. 2022, 8) notes that incidents such as the Global Financial Crisis

increased awareness of how specific events (such as physical hazards, or economic or geopolitical events) have knock-on effects across regions and sectors through interconnected and interdependent systems, causing unmodelled losses and potentially systemic collapse. Yet risk analysis and risk modelling have been largely unconcerned with these relational and procedural aspects of risk that cause cascading failure.

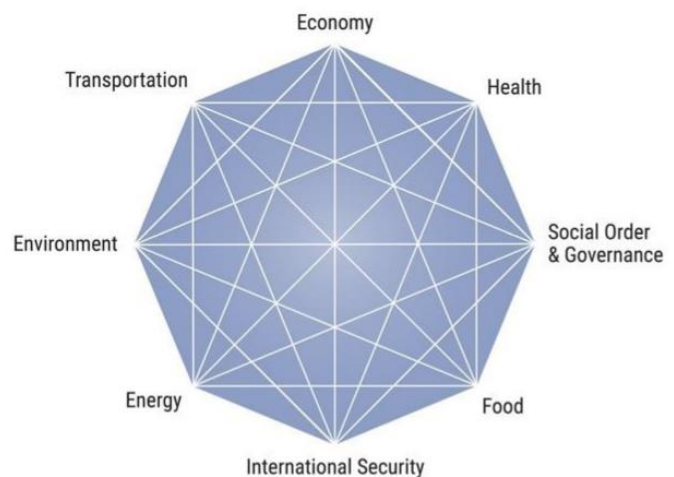
worsen or dampen the emergent harms of the conjoined crises. It is conceivable, for example, that a failure of internet communication networks disrupts the spread of a stock market panic. Yet it seems more likely that causal interactions between systemic crises will worsen, rather than diminish, the overall emergent impacts.

Scale: In principle, a polycrisis could occur at any scale at which multiple systemic risks interact, from several afflictions compounding their harms to a single organism to failures in several of a country’s social systems and beyond. A *global* polycrisis unfolds at a spatial extension that affects the whole planet and/or all of humanity. While the threshold at which a crisis becomes truly global remains debatable under this definition, we should be able to distinguish polycrises occurring at the global scale from those operating at a regional, continental, national, or local scale.

Threshold of harm: At the global scale, a polycrisis is so harmful as to significantly degrade humanity’s prospects. This (somewhat ambiguous) harm threshold could involve massive immediate casualties, but also sustained and widespread decline in the quality of life into the future. At this threshold, the possibilities for maintaining and improving human wellbeing decline precipitously. At the extreme, a global polycrisis could constitute an *existential risk*, on the scale of a large asteroid impact or major nuclear war, that would destroy humanity as a species. Or a polycrisis may cross the slightly lesser (but still unconscionable) threshold of *global catastrophic risk*. Some define the catastrophe threshold quantitatively, as an event that kills somewhere from ten (Cotton-Barratt et al. 2016) to twenty-five (Kemp et al. 2022) percent of the human population. Others define catastrophic risk qualitatively as an event that would bring about the collapse of human civilization (GCRI, n.d.). The harms of a polycrisis could, but need not, meet these thresholds; but the effects of polycrisis do involve both the loss of life and the loss of desirable ways of life at the scale of humanity.

Multiple global systems: The notion that crises can travel *between* global systems presumes that we can distinguish *separate* global systems and their boundaries. Otherwise, the polycrisis concept makes no sense. Boundaries should demarcate denser clusters of interconnectivity within the system versus between the system and its environment. The boundaries of complex systems, however, are necessarily fuzzy because they are open to exchanges of energy, materials, and information with their environments. System boundaries are also somewhat intersubjective insofar as they depend on the question under investigation.¹ We can “cut up” our reality in a number of different ways, and different

Figure 1: Social system categories of the Inter-Systemic Cascades Project



¹ They are intersubjective because they can be debated and justified among the community of relevant experts, and hence not individually subjective; they are not objective because they depend on the vantage point of the observer and their purposes.

categorizations will make more or less sense in different parts of the world, for different areas of activity, and for different analytical purposes.

When tracing the inter-systemic effects of the COVID-19 pandemic, for example, the Cascade Institute used the typology of global systems represented in Figure 1. But of course, other schemas may prove more plausible and more useful, depending on the issue under investigation.

2. A brief history of the polycrisis concept

Though still uncommon, the term polycrisis is not new. It has been defined and applied in different ways over the past two decades. The formulation presented above is tailored specifically to elucidate the concatenation of harms facing the world today. It is nonetheless important to consider the alternative (though similar) ways in which others have employed the term polycrisis.

The concept was first and very briefly introduced by the French philosopher, sociologist, and complexity theorist Edgar Morin and co-author Anne Brigitte Kern in their 1999 book *Homeland Earth: A Manifesto for a New Millennium*. These authors wrote of “interwoven and overlapping crises” affecting humanity and argued that the most “vital” problem of the day was not any single threat but the “complex intersolidarity of problems, antagonisms, crises, uncontrollable processes, and the general crisis of the planet”—a phenomenon they labeled the polycrisis (Morin and Kern 1999, 74).

Adopting the concept from Morin and Kern in 2013, South African sociologist and sustainable-transition theorist Mark Swilling defined a polycrisis as “a nested set of globally interactive socio-economic, ecological and cultural–institutional crises that defy reduction to a single cause” (2013, 98). Swilling has since used the concept as a comprehensive label for the multiple interconnected crises facing the global political economy, including climate change, rising inequality, and the threat of financial crises (Swilling 2019; 2013). Like Morin and Kern, he emphasizes the simultaneity of crises and the connections between them, but Swilling more explicitly proposes that these connections produce complex interactions that multiply the crises’ total impact.

More recent scholarship (2018-2022) has used “polycrisis” to refer to the simultaneous crises facing the European Union in the aftermath of the 2007-2009 Global Financial Crisis. Most of this writing appeared in a 2019 special issue in the *Journal of European Public Policy* entitled “The European Union beyond the Polycrisis? Integration and Politicization in an Age of Shifting Cleavages” (Zeitlin, Nicoli, and Laffan 2019). The authors of this special issue use the term somewhat loosely to describe the simultaneous occurrence the sovereign debt crisis of southern European states, the refugee and migration crisis precipitated substantially by the Syrian civil war, Brexit, and the rise of far-right authoritarianism. After years contending with these challenges, then-President of the European Commission Jean-Claude Juncker declared in 2018 that the EU had “slowly but surely turned the page from this so-called polycrisis” (Juncker 2018).

In the donor community, the [Omega Resilience Funders Network](#) (ORFN) has explicitly adopted the polycrisis concept to frame its philanthropic interests. It describes the polycrisis on its website as “the sum total of all stressors affecting planetary health,” distinguishing between “biosphere stressors” (e.g., climate crisis, biodiversity loss, ocean acidification), “societal stressors” (e.g., poverty, supply chain vulnerabilities, war), and “technological stressors” (e.g., automation and AI, cyber threats, data threats to democracy). ORFN also characterizes the polycrisis as unprecedented, suggesting that it is not simply the aggregation of discrete stressors at any given time but a novel phenomenon emerging from the stressors’ convergence and interaction (Lerner 2022). And finally, the [V. Kann Rasmussen Foundation](#) recently hosted the international conference “Exploring the Polycrisis” but remained agnostic and pluralist about the concept’s definition.

Though similar, these uses of the polycrisis concept differ on three issues: scale, singularity, and timescale.

Is a polycrisis inherently global? Morin, Kern, Swilling, and ORFN conceive polycrisis at a specifically global scale, whereas in the European context the term is used at a regional or continental scale. In principle, a polycrisis could occur at any scale that hosts multiple interacting systems—local, national, regional, or global.² The Cascade Institute is particularly concerned with interacting crises at a global scale, those that affect the future of humanity and the planet as a whole. We therefore specify our focus as *global* polycrisis.

Can there be multiple polycrises? The same people who focus on polycrisis at a global scale (Morin, Kern, Swilling, and ORFN) also use the definite article “the”—as in “the polycrisis”—to indicate they are referring to a singular phenomenon that is already occurring. It is conceivable, however, that multiple polycrises could unfold simultaneously but separately, each in a different set of systems. Each and every crisis is certainly not connected to each and every other crisis in a significant way, and the polycrisis concept should not be overextended to encompass every ill confronting humanity. At the same time, the dense interconnectivity between global systems creates numerous pathways for crises to intersect. While multiple global polycrises could occur simultaneously but separately, we speculate that their interconnections will grow over time, and if they are not resolved, they may amalgamate into a single polycrisis. Multiple concurrent polycrises are possible; the purpose of the polycrisis concept is to draw attention to the causal interactions (or lack thereof) within and between them.

Is a polycrisis temporary or enduring? Juncker’s speech, quoted above, implied that the European polycrisis was a temporary confluence of risk events. The other usages imply a more long-term, enduring, and still unfolding process. The latter view allows us to consider the buildup of long-term stresses as key structural foundations for more proximate flare-ups of crises (see, for example, Homer-Dixon et al. 2015; Homer-Dixon 2006). The crises confronting humanity today and tomorrow involve long-term processes such as resource scarcity, environmental degradation, growing global interdependence, demographic change, and shifting belief systems. These underlying drivers require a long-term perspective on polycrisis. While a polycrisis could be either a temporary or long-term affair, we postulate that their causality generally involves at least some long-term processes.

² Similarly, some scholars argue that systemic risks must operate at the global scale (Schweizer and Renn 2019; Renn et al. 2019), while other say they may arise and remain at sub-global scales—at any level that hosts a system that is vulnerable to collapse (Sillmann et al. 2022).

3. Polycrisis and systemic risk

Implicit in the polycrisis definition presented in Section 1 is the realization of a particular type of risk—*systemic* risk. Polycrisis and systemic risk are closely related concepts, but their differences are important. Systemic risk has been defined in even more ways than has polycrisis, but the most commonly cited characterization comes from the banking sector, where Kaufman and Scott (2003, 371) define systemic risk as “the risk or probability of breakdowns in an entire system, as opposed to breakdowns in individual parts or components, [as] evidenced by co-movements (correlations) among most or all parts.”

Whereas conventional conceptions of risk focus on the likelihood and harms of particular events (such as a car accident, fire, terrorist attack, bankruptcy, etc.), systemic risk concerns the possibility that one or more triggering events could cause a series of effects that spread throughout a social or natural system and disable its functionality. Rather than a discrete event or harm, “it is the totality of the threat, the probability that the entire system can collapse, that distinguishes systemic from other types of risk” (Renn 2016, 29).

The polycrisis concept adopts two core features of systemic risks:³

1. An unexpected problem that arises in one part of the system quickly spreads to disturb the entire system (generally through some sort of contagion in a network or wide-ranging chains of cause and effect).⁴
2. The disruption of the initial system may have spill-over effects that disrupt other systems.⁵

The first feature arises from the high interconnectivity among system elements. The second implies that there are discernible boundaries that separate one system from another, but which remain open to exchanges of energy, matter, and information (and people) between systems.

Beyond these shared foundations, the concept of polycrisis differs from systemic risk in at least three important ways (see Table 1 below). The most important difference, introduced above, is that systemic risk (indeed, any study of risk) concerns the *potential* for harms to unfold whereas polycrisis involves the *realization* (or activation) of those possibilities into actual chains of events in the world. The difference between the study of systemic risk and polycrisis is the difference between the potential and the actual amidst a shared concern about cascading systems failures.

³ These characteristics are notably similar to two of the three key processes involved in synchronous failure (simultaneous stresses and ramifying cascade) and to the two stages of synchronous failure (see: Homer-Dixon et al. 2015).

⁴ The concept of systemic risk “assumes a systems perspective, postulating connections between elements of the system. Failure in a sub-unit or cluster of the system will lead to cascading events in other system units. These cascading events may lead to major disturbance or even complete failure of the whole system. Cascading events are caused by ‘trigger events’... Systemic risks therefore occur when a hazard will not only lead to negative effects in parts of the system, but also the failure of the system as a whole” (Schweizer 2021, 79).

⁵ Renn (2016) writes: “Another key characteristic that sets systemic risks apart from conventional risks is that their negative physical impacts (sometimes immediate and obvious, but often subtle and latent) have the potential to trigger severe ripple effects outside of the domain where the risk is located. When a systemic risk becomes a calamity, the resulting ripple effects can cause a dramatic sequence of secondary and tertiary spin-off impacts. They may be felt in a wide range of seemingly divergent social systems, from the economy to the health system, inflicting harm and damage in domains far beyond their own” (30-31).

Second, polycrisis (by definition) involves crises in multiple systems, whereas systemic risk may not. A systemic risk generally arises within a single system, and then may or may not cascade from this “system of origin” into neighboring “spillover” systems.⁶ When it does, the systemic risk literature generally countenances *one or two* spillover systems. The concept of polycrisis, on the other hand, is always—and specifically—concerned with the interaction of crises in *multiple* systems. It could involve the interaction of just two systemic crises. Such a pairing, however, may yet be analyzed effectively without the polycrisis concept. Interactions among *three or more interconnected systemic risks* are generally far harder to analyze, because the number of combinatorial possibilities arising from these interactions explodes.⁷ The polycrisis concept is intended to highlight such complex interactions between a multiplicity of crises.

Finally, the concepts of systemic risk and polycrisis locate the complexity of threats in different places. Several scholars have compiled a more comprehensive list of the core properties of systemic risks that highlight their complex behaviors (Sillmann et al. 2022; Renn et al. 2020; 2019). Though terminology may vary, the consensus is that systemic risks exhibit four properties:

1. **extremely complex and dynamic networks** of multiple, synergistic causes and feedback loops (Renn et al. 2020; 2019; Schweizer and Renn 2019);
2. **highly nonlinear cause-effect relationships** (disproportional causation), with numerous equilibria, unpredictable tipping points, and hysteresis (Schweizer and Renn 2019; Renn et al. 2019);
3. **causal processes that cross boundaries** of administrative and political units, social sectors, and scientific disciplines and that operate on multiple time scales across natural, social, and technological systems (Renn et al. 2020; Schweizer and Renn 2019); and
4. **deep uncertainty** about both underlying causes and ultimate consequences (Renn et al. 2020; Schweizer and Renn 2019).

The polycrisis approach emphasizes all these features. But instead of understanding them as characteristics of a risk, the polycrisis approach treats them as *properties of the systems involved*, which create the possibility of systemic failure. Systemic risks and polycrisis both arise from the organization of human activities into complex global systems structured in ways that enable problems to spread through the system’s parts and spill over into other areas of activity. Our approach to global polycrisis focusses specifically on the features of global systems that render them vulnerable to systemic risks and crises. Such systems architecture may include network structures, the tight coupling of connectivity, exchanges with other systems, the homogeneity or heterogeneity of elements, key thresholds, limits to growth, and crucial feedbacks. Together, such features constitute the causal dynamics of complex systems. The polycrisis concept focusses on the organization of the system in such a way that the triggering event spreads in a rapid cascade of additional harms through this causal architecture.

⁶ For example, a drought affecting crop yields in one region (system of origin) leads to food shortages in another region (spillover system #1) that in turn trigger social unrest and violence (spillover system #2) (Gaupp 2020). In this case, the systemic risk includes the initial drought and the cascading consequences in two spillover systems.

⁷ Indeed, the first version of this discussion paper specifically defined polycrisis as the interaction of systemic risks in *three or more* systems.

Table 1: Differences between the concepts of systemic risk and polycrisis

| | Systemic Risk | Polycrisis |
|-----------------------------------|--|--|
| Focus | The potential for a failure in one part of a system to spread throughout the system and disable it | The causal interactions between actually unfolding crises—that is, between systemic risks that have been realized into chains of real-world events |
| Number of systems involved | One or more | Multiple |
| Locus of complexity | Characteristics of risks | Systemic architecture that creates risks and crises |

5. Next steps on polycrisis research

This paper argues that “global polycrisis” is a necessary and productive concept with which to understand and address some of humanity’s greatest challenges. In its *intension*, a global polycrisis can be clearly defined as the *causal entanglement of crises in multiple global systems* that significantly degrade humanity’s prospects. The interaction of these crises produces different dynamics and greater harms than they would separately. Defined this way, the concept of global polycrisis requires a different sort of analysis from conventional studies of risk and crisis. It demands a focus on the system structures and properties that enable problems to cascade.

The concept’s *extension* includes such multi-systemic crises as the Covid-19 pandemic and Russia’s invasion of Ukraine, both of which provide vital directions for future research.⁸ The *analytical function* of the concept in such applications is to focus attention on the *causal mechanisms* by which a crisis spreads through one global system and then interacts with crises in other global systems to create an inextricable global polycrisis. As a preliminary hypothesis, we suspect that *positive feedbacks* play a crucial role in amplifying, accelerating, synchronizing, and interweaving crises across global systems. A key research question is thus how these positive feedbacks form between global systems and their crises. The value-added of the global polycrisis framework ultimately hinges on its ability to generate novel, profound, and actionable insights on dynamics such as these.

⁸ For the inter-systemic connections of global problems stemming from the COVID-19 pandemic, see the Cascade Institute’s series of Inter-Systemic Cascades Briefs: <https://cascadeinstitute.org/research/briefs/>.

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