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Corresponding author: Sienna Mark;
Email: mark.s@northeastern.edu

Understanding polycrisis: definitions, applications, and responses

Sienna Mark[1], Samantha Holder[2,3], Daniel Hoyer[2,3], Rod Schoonover[4] and Daniel P. Aldrich[1]

[1]Political Science, Northeastern University – Boston Campus, MA, USA; [2]Seshat, Global History Databank, San Antonio, FL, USA; [3]Societal Dynamics (SoDy), Toronto, Ontario, Canada and [4]Georgetown University, Washington, DC, USA

Abstract

Non-Technical Summary. The term 'polycrisis' is gaining attention among academics, policymakers, and the public. Unlike a single crisis, a polycrisis involves complex, interconnected risks across multiple regions and systems, often including ecological factors. This interconnectedness heightens the chances of widespread adverse outcomes or disasters, affecting various systems and triggering cascading effects. The article examines how traditional disaster studies concepts must be adapted for the polycrisis context and places historical events on a spectrum of such critical moments. It concludes with recommendations for communities to build resilience and respond democratically to these challenges.
Technical Summary. The term 'polycrisis' has entered the lexicon of a growing circle of academics, policymakers, and the public. Polycrisis is a state that encompasses a complex set of risks characterized by multiple, macroregional, and often ecologically embedded linkages between inexorably interconnected systems. The article reevaluates disaster studies concepts within this polycrisis framework, locates historical events along a spectrum of such moments, and offers recommendations for democratic resilience.
Social Media Summary. Discover how the term 'polycrisis' redefines our understanding of interconnected risks and informs new disaster response methods.

1. Introduction

We seek to understand the interconnections of global-level risks, vulnerabilities, and events termed *polycrises* (explained below) to accurately define and address complex contemporary challenges. A growing number of scholars and policymakers (Albert, 2025; Georgieva, 2022; Guterres, 2022) contend that without systems thinking and approaches centered on the critical role of disparate but interdependent systems, decision-makers artificially discretize what are deeply connected issues. As Kristalina Georgieva of the International Monetary Fund recently remarked: 'In a world where war in Europe creates hunger in Africa; where a pandemic can circle the globe in days and reverberate for years; where emissions anywhere mean rising sea levels everywhere—the threat to our collective prosperity from a breakdown in global cooperation cannot be overstated' (Associated Press, 14 April 2022).

This article reviews a definition of the term and offers alternative conceptualizations, provides historical and recent events to which the concept may apply, and offers responses for managing our current polycrisis.

2. Conceptualizing polycrisis

The term *polycrisis* represents an important advance in how decision-makers and researchers understand and articulate the growing number of new global challenges. Since 2019, several major governmental institutes and non-governmental organizations have utilized the concept, including the United Nations and the World Economic Forum (WEF), along with increasing use by academics. *Time* magazine declared polycrisis 'the buzzword of the day' at the beginning of the WEF's January 2023 meeting in Davos. However, as the term's use has grown in academic and policy circles, its lack of precision has become more apparent. Critics have raised substantive challenges to the term, arguing that what appears to be interconnected crises may reflect a tendency to perceive connections between weakly related phenomena, and proposing alternative concepts like 'polysolutions', wherein responses to certain crises simultaneously address others through economic and political buffer mechanisms. These critiques challenge the core assumption that multiple crises are self-reinforcing, suggesting that they often

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trigger innovative solutions and enhanced cooperation. We return to this concept below. Persistent misunderstandings and disagreements of the term likely stem from the inherent ambiguity that arises when attempting to clearly define such a complex concept (Lähde, 2023; Smith, 2022).

Researchers from the Cascade Institute (CI) developed a detailed definition, calling a global polycrisis 'the causal entanglement of crises in multiple global systems in ways that significantly degrade humanity's prospects' (Lawrence et al., 2024, Lawrence, 2022). This highlights how interconnected our systems have become and how the risks faced by these systems are also inextricably intertwined. Their interconnectedness increases the chances that disruption to one will ultimately, and often quickly, reverberate to others. As such, the negative outcomes that often emerge from these interactions cannot be understood by looking solely at one of the constituent systems.

These systems are dynamic, with risks developing on multiple time scales, from very long-term stresses that take decades or more to emerge to the acute shocks that arise seemingly instantly. The Global Financial Crisis of 2008–2009 involved the entangled mesh of cross-border economic, social, and political systems and their vulnerabilities. The financial stress 'intersected with oil supply constraints and long-term stresses in food production to produce cascading bankruptcies, food price hikes, and political unrest worldwide' (Homer-Dixon, et al., 2015). The CI definition establishes that a polycrisis is more than just a group of simultaneous crises and underscores their deep interconnectedness. This entanglement can lead to multiplicative harm (Lawrence et al., 2024).

Other authors explore its intersections with revolutionary theory (Ainsworth & Hoyer, 2025), political economy (Albert, 2025), and crisis transmission (Brosig, 2025). Polycrisis can also be understood as a socially constructed phenomenon, shaped by the ways in which crises are perceived, framed, and narrated (Oliver-Smith et al., 2017; Rodríguez & Barnshaw, 2006).

There are still several aspects of the polycrisis concept that require deeper exposition, such as how vulnerabilities, exposure, and stresses create risk and how this risk can develop into dysfunction across multiple, entangled systems.

3. Exploring the critical features of polycrisis

Critical questions raised by any definition of polycrisis include: What is risk, and what factors increase risk? What is the relationship between risk and crisis, and between crisis and its outcomes? What factors increase risk and (potentially) produce a crisis, how do they operate, and how do they interact across systems and over large spatio-temporal scales, leading (potentially) to polycrisis? What determines how, when, and to what degree a crisis will manifest into realized dysfunction or disaster?

We now examine each term under the assumption that highlighting their core features will help articulate how polycrisis differs from crisis and how they relate to risk and disaster. Table 1 offers a brief summary of the core terms involved in these definitions, noting where they are employed differently in various fields. In the subsequent subsections, we scrutinize each of these terms, highlighting how they are used in traditional crisis and disaster studies and pointing out challenges in applying them to current circumstances. Through this discussion, we argue why the term is needed to understand contemporary societies' multidimensional challenges.

3.1. What is risk, and what constitutes a crisis?

Most conceptualizations of crisis incorporate the notion of risk, defined as the probability or potential that an adverse outcome will arise from one or more contributing factors such as hazardous events or 'shocks' (United Nations Office for Disaster Risk Reduction, 2009). Risk is understood as a combination of causal factors, the system's vulnerability, and its exposure (Table 1). This relationship not only is commonly employed in science and risk management, but also holds considerable utility when discussing social systems, particularly in interdisciplinary dialogues between social and biophysical scientists.

For instance, consider a bridge as a 'system' in which concrete, iron bars, and other materials combine to create a traversable space over a river. The bridge faces risk if major forces, such as strong gusts of wind or an earthquake, arise, as these can compromise the bridge's integrity. The bridge's vulnerability and exposure to these destabilizing forces also add to the risk it faces. It may also be vulnerable to a tornado, meaning it would likely be damaged if a tornado were to hit. However, if the bridge is located in an area that rarely experiences tornadoes, its exposure to them is low, thereby decreasing its overall risk.

While this framework effectively explains individual or discrete risks, applying it to systemic risk is more challenging, as it involves an entire interconnected system's potential faltering or collapse (Gambhir & Lempert, 2023; Renn et al., 2022; Scheffer et al., 2012). In such contexts, the concepts of vulnerability and exposure may be harder to localize and quantify, but the basic framework is still relevant. Therefore, evaluating systemic risk necessitates comprehending the system's interdependencies, which are often, if not usually, invisible, but which shape how risk arises and leads to various outcomes within or across complex systems.

The term 'crisis' is used inconsistently. Some see it as heightened risk (e.g., water shortage), others as the outcome of that risk (e.g., famine deaths). Our framework differs from the CI framework on this point. Both, however, aim to illustrate the interplay of escalating risk and its impacts. We define a crisis as a system facing elevated, escalating risk requiring urgent decisions to avoid severe outcomes. These decisions have broad implications. Thus, we focus on crisis as a period of high, and generally rising, risk, highlighting how responses shape future paths.

By centering both risk and decision-making in our crisis framework, agency, culture, and values naturally emerge as integral components. This perspective aligns with substantial governance scholarship, highlighting how institutional structures, accountability mechanisms, and policy contexts fundamentally shape decision-maker agency and influence response effectiveness (Renn, 2008; Folke et al., 2005). Decisions are not made in a vacuum; they reflect institutional norms, cultures, and values that determine priorities, acceptable trade-offs, and the legitimacy of responses. Effective decision-making, particularly in governance contexts, requires robust information, transparency, and clearly articulated policy guidance, since risk itself is immaterial and inferred from data, models, and expert judgment (Cash et al., 2003).

For example, the ongoing climate crisis encompasses not only the heightened risks associated with a warming planet and other

Table 1. Key terms

Term	Definition	Example(s)	Other considerations
Causal Factor	A factor that can undermine or disrupt system functioning	A bridge experiences issues that undermine its stability	Often called a 'hazard'
Trigger	A causal factor of short duration and relatively constrained spatial extent, but comparatively large magnitude	A bridge experiences a sudden burst of extreme winds	
Stress	A causal factor of longer duration and extent, with gradually increasing magnitude	A bridge experiences corrosion of its supports	
Vulnerability	The degree to which a system is susceptible to a given causal factor	A bridge has limitations on the winds that it can withstand due to its construction standards	
Exposure	The degree to which a system is subject to a given causal factor	A bridge is located in a region in which extreme winds are increasing	
Risk	The likelihood that an adverse outcome will transpire from one or more factors. Risk = (causal factor)(vulnerability)(exposure)	The likelihood that a bridge's integrity is undermined by high winds	In some fields, such as finance and business, risk is defined as the probability an event will occur multiplied by its potential harm.
Outcome	The result after a system has experienced elevated risk and often one or more trigger events as well	A bridge whose stability had been at risk buckles due to extreme winds.	Some refer to this as realized (vs potential) harm. A 'disaster' is a particularly damaging outcome of risk.
Crisis	A period of severe difficulty or danger in which critical decisions must be made. Distinct from a high-risk situation by its multi-domain challenges, trade-offs, and potentially severe outcomes.	High winds coupled with a bridge's weakened structural integrity create an imminent risk of collapse with a high probability of adversely affecting large numbers of people. Decision-makers must confront immediate public safety concerns, coordinate emergency repairs, and manage widespread traffic disruptions, all while assessing the long-term implications for the city's infrastructure and economy.	Others, including the authors of the CI report, use crisis to refer to the outcomes of risk.

manifestations of climate change, but also the challenging decisions that must be made in response to these risks. The crisis emerges from the necessity of making challenging policy choices, whose consequences span multiple domains and jurisdictions, particularly as institutional coordination and social acceptance profoundly affect these choices (Biermann et al., 2010; Adger et al., 2013). Furthermore, the climate crisis is exacerbated by the slow pace of action, highlighting the critical role of agency, or the lack thereof, in avoiding disaster (Gambhir & Lempert, 2023).

The CI report defines a crisis as when a system is pushed out of equilibrium, leading to harmful outcomes (Lawrence et al., 2024). This associates crisis with system state, but this may not suit social, economic, or ecological systems, which are constantly changing. Equilibrium terminology can thus overlook the inherently dynamic processes that mediate adaptations and responses within evolving systems (Folke et al., 2005)

A primary issue at stake is how we understand the timing of a crisis. In our framework, crises arise with the risk of potential detrimental outcomes rather than only once they are realized. By emphasizing decision-making and information requirements for assessing risk, we shift the analytical focus to earlier stages of policy intervention (Renn, 2008). This approach brings crisis identification forward in time, underscoring the critical governance window in which disaster-averting decisions must be made, guided by timely and robust information on risk.

During the Cuban Missile Crisis, the USA faced not only nuclear exchange risk but also challenges beyond military and diplomatic concerns. Global politics, morale, environmental damage, and arms control were all factors. The situation had potential for vast destruction, though this risk was not realized (Allison, 1971). Crises can also lead to positive adaptations, like Chernobyl becoming a wildlife haven after its 1986 meltdown (UNEP 2020).

3.2. What factors increase risk, and how do they operate?

To understand a system's risk, whether it's the global economy, regional infrastructure, or a local park, we must identify the factors that can damage it. These factors are of two types. First, 'stresses' are slow-moving, widespread forces that build over time, putting ongoing pressure on systems. Examples include population growth, climate change, chronic poverty, discrimination, and prolonged conflicts (Sagara, 2018). Second, 'triggers' or 'shocks' are sudden, localized disturbances with a large impact on affected areas. These include natural events like hurricanes or volcanic eruptions, and social events like uprisings or invasions (Sagara, 2018). As noted in the CI report, while stresses can disrupt systems on their own, they also increase the potential impact of sudden shocks (Lawrence et al., 2024).

Most work in disaster and crisis management focuses on the acute shocks that precipitate major disasters (Del Rio-Chanona et al., 2020; Fisher, 2024; Gambhir & Lempert, 2023; Puma et al., 2015). Other fields, particularly those focused on social crises, tend to concentrate on the stresses that build up over time (Hoyer et al., 2023; Renn et al., 2019; Schweizer & Juhola, 2024). Focusing on only one or the other, however, misses the more complex interplay of these forces, which operate on different time scales in generating risk and, hence, realized crises. In this, our framework is well aligned with the CIs.

3.3. How do these factors interact to produce polycrisis?

The CI report argues persuasively that a polycrisis is not a single event but a situation where multiple interconnected systems are disrupted, with feedback loops causing compounding harm.

The COVID-19 crisis illustrates this. Increased human–wildlife interaction raises the risk of novel pathogens. High transmissibility and asymptomatic spread increased outbreak probability. However, human factors like global mobility, delayed response, poor public health measures, infrastructure stress, inequality, and misinformation drove the pandemic. It then caused economic and food security issues, increasing socio-political tensions. We therefore agree with the CI's perspective in viewing the pandemic not as 'the' polycrisis, but as a manifestation that deepened our ongoing polycrisis.

The onset of the pandemic was undoubtedly a global shock, but it was likewise the outcome of various longer-term stressors as well. Significantly elevated risk developed across multiple systems, which resulted in disruptions producing real, significant, and lasting harm to large segments of human and non-human populations (Schweizer & Juhola, 2024). Only by incorporating an understanding of these risks, including the different vulnerabilities to them of different countries and communities, can we hope to comprehend the outcomes experienced (and still being felt) from this major event. Namely, the sort of multi-scalar and multi-faceted diagnosis that traditional approaches to crisis studies struggle with. Furthermore, much of the devastation stemmed from poor decision-making during the crisis, underscoring the importance of this aspect of our framework.

3.4. Planetary boundaries and polycrisis

Until recently, addressing elevated risks and their likely (and realized) impacts often focused primarily on human-built infrastructure and systems. For example, during the American federal government's response to Hurricane Katrina, the vast majority of funds went towards protecting New Orleans through gray infrastructure, such as upgraded levees, larger pumping stations, and new building codes. Alternatively, efforts could have focused on diplomacy and de-escalating human conflict, as during the Cuban Missile Crisis and many other state-to-state conflicts. However, as we have come to better understand the interactions between human and natural environments, the fragility of ecosystems and the degree to which human actions have destabilized them has become all too clear. From our perspective, Earth system stress, climate change, biosphere destabilization, land-system change, pollution, and the like (Richardson et al., 2023; Rockström et al., 2023) are a foundational aspect of our modern polycrisis, and may be a critical feature of most, if not all, identifiable periods of polycrisis.

A group of Earth system scientists recently published an update to its Planetary Boundaries Framework (see Figure 1 further), an endeavor that seeks to quantify the degree to which anthropogenic activities have driven particular Earth systems into an exceedingly harmful state for humanity (Richardson et al., 2023). The authors argue that six of the nine planetary boundaries they assess are beyond a safe operating space: novel entities (pollution, plastics, etc), biosphere integrity, biogeochemical flows, climate change, land-system change, and freshwater change. Moreover, worsening ocean acidification is approaching its identified limit. In many respects, crises of the past, even those 20 years ago, happened on a fundamentally different planet. Crises of the future will be entangled with manifestations of Earth system stress.

The Planetary Boundaries Framework research and related scientific compendia (IPCC, 2023) carry several important implications for understanding polycrisis. First, as noted, many of the nine Earth systems identified by this framework have already exceeded 'safe' levels of functioning, while several others are at high risk of being breached. The key factor here is the risk faced by these systems of further harm and the risk faced by other biophysical and social systems as a result of these boundaries being crossed. The risk profile of our current moment as a result of these interconnected forces is, in a word, unprecedented. Past human civilizations have suffered or collapsed from environmental shocks and even long-lasting and interconnected stress, which sometimes did present on fairly large, inter-regional scales. However, the risks raised during these periods of environmental strain were typically less anthropogenic than recent stressors, far less multifaceted, and rarely, if ever, manifested on the truly planetary scale of our present ones.

The second major insight gained from this perspective is that the risk associated with the interconnected set of biophysical and socio-ecological stressors is not a future concern but a present one. Although negative outcomes from these stressors may transpire in the near- or even long-term, the policies, actions, and coordination required of decision-makers to manage most of these risk elements are rooted in the present. Third, Earth system stresses are so extensive that individuals and societies face considerable risk irrespective of policy choices; in other words, the burden that decision-makers now face is how hard the hard landing will be. Lastly, as risk management usually involves trade-offs, decisions are likely to be increasingly consequential for those on the wrong side of the ledger.

In our conceptualization, then, **polycrisis is a state that encompasses a complex set of risks characterized by multiple, macroregional, and often ecologically embedded linkages between inexorably interconnected systems.** Such heightened multisystem risk then raises the probability that an adverse outcome will be experienced in one or more systems, which in turn are likely to cascade to others, necessitating an awareness and response to maintain (or restore) system functioning in the face of these risks and the disasters they tend to spawn. The convergence of acute and chronic stressors leads to a situation where risks no longer remain confined to individual sectors or regions. Instead, they merge, accelerating systemic breakdowns and challenging traditional crisis management approaches that were designed to handle discrete, independent disasters.

In a polycrisis, risks can intertwine with stresses and shocks, often producing new risks and outcomes. Each element can manifest to a greater or lesser degree; for example, macroregional can refer to a continental, transcontinental, or truly global scale, as in our present age. Indeed, we argue that **crises exist on a spectrum from spatially and temporally constrained, mono-systemic risks to our current state of global polycrisis**; we return to this critical point in the 'Historical Analogs' section below. What matters most for our conceptualization of polycrisis, which we share with the CI researchers and several other groups, is that the most critical difference between polycrisis and other forms of crisis or multisystemic disaster is the continuing feedback — the causal entanglement —

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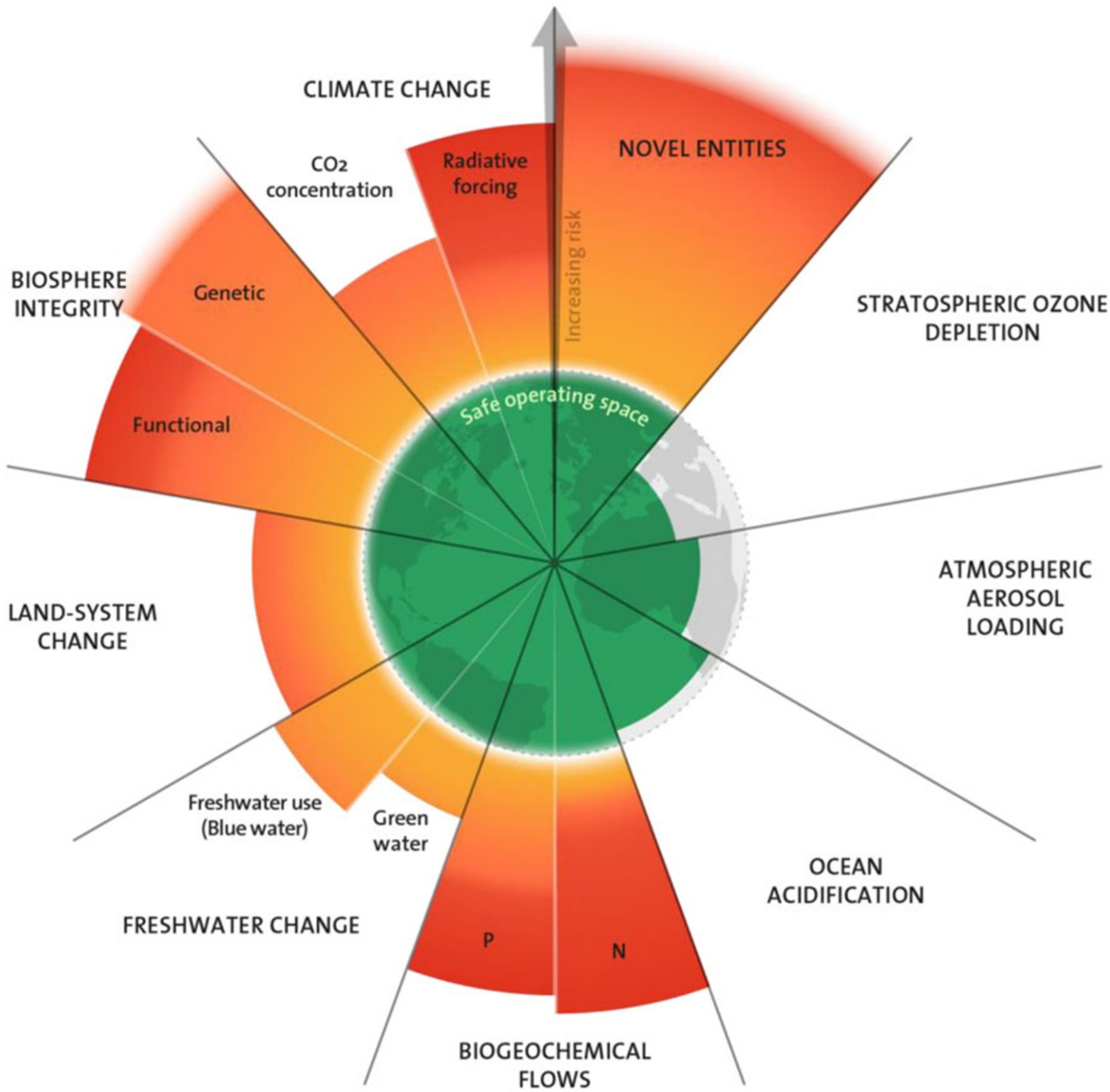

Figure 1. Planetary boundaries crossed or in danger of being breached. Reproduced from Richardson et al. (2023).

between heightened risk, intense stresses, and adverse outcomes at multiple levels and across multiple, interacting systems.

4. Conceptualizing outcomes during polycrisis

As noted earlier, a variety of fields, including engineering, resilience, social science, and epidemiology, use terms like 'crisis', 'disaster', 'catastrophe', 'risk', and 'shock' in different ways and sometimes interchangeably. Yet their deployment in different fields and contexts remains frustratingly inconsistent. This has led to the proliferation of numerous, partially overlapping concepts that seek to explain the complex relationships between systems and how they can become disrupted. Above, we discuss the way that the polycrisis concept incorporates and in some ways transcends traditional approaches to understanding what risk is and how it may grow in different contexts. Here, we focus on the other side of the equation, looking at the concepts that scholars have traditionally used to make sense of the different complex outcomes which can arise from such risk; these notably include 'cascading disasters', 'compound disasters', and 'recurring acute disasters', all of which may transpire within a polycrisis. Table 2 below summarizes the key differences between these terms, especially regarding their scope, type of interaction, and prospects for recoverability.

Disasters are 'a serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses that exceed the ability of the affected community or society to cope using its own resources' (Moddemeyer et al., 2022: 9). It is also worth noting that much recent literature in risk and resilience employ the term disaster only for a particular outcome, not for the precipitating shocks that lead to it (Burton et al., 2022; Kelman, 2020; Raju et al., 2022). In other words, any given ecological shock should not be seen as a direct, lone cause of a disaster; rather, it will always be the interaction of that shock with the prevailing stresses, vulnerabilities, and exposures across several different biophysical and social systems that determine how any given shock will actually play out, whether they lead to a 'disaster', 'catastrophe', or any number of other outcomes (including non-realization).

A catastrophe can be considered a subtype of disaster, characterized by its particularly severe impact and long-lasting

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Table 2. Categories of disasters and scope of potential outcomes

Category	Example	Geographic range	Timeframe of impact	Event occurrences	Additive/interactive	Recoverability
Cascading disaster	Japan's 3/11 disasters	Localized	Short term	Sequential	Yes	High probability
Compound disaster	Africa Locust Swarms	Usually Localized	Short-term	Simultaneous	Yes	High probability
Recurring acute disaster	Puerto Rico 2017–2020	Localized	Long-term	Sequential	Yes	Low probability
Polycrisis		Global	Medium–Long term	Sequential/Simultaneous	Yes	No to low probability

consequences. While all catastrophes are disasters due to their nature of causing significant harm and disruption, not all disasters rise to the level of catastrophes. Catastrophes are the most severe and impactful form of disasters, often resulting in profound and enduring consequences (Braga et al., 2008: 2; McGlown, 2011). This perspective is necessary to explain, for instance, why one country, Pakistan, to cite a recent example, can be sent into a major humanitarian emergency when hit by a flash flood, whereas another country (Canada) hit by a similar event at similar time, experiences much more mild, though still devastating, impacts (British Red Cross, 2023; FloodList, 2023).

These outcomes can occur in the biophysical sphere and/or in the societal/human sphere. The application of these terms, however, differs between these spheres and is heavily dependent on the field from which they are viewed. In biophysical systems, disasters are nearly always associated with nonlinear responses to external pressures, particularly long-run stresses. In this sense, disasters often arise when a particular (important) threshold is crossed, and the system can no longer maintain key functions. In ecology, these are called regime shifts, and in physics, they are critical transitions. Most regime shifts are not large, however. There are two important ways in which thresholds can be crossed: through external shocks, which are most commonly recognized, and through changes in internal conditions, including increasing vulnerability and/or exposure to stressors.

Alternatively, many scholarly fields, including political science, sociology, and economics, understand such outcomes as social constructs, products of human practices rooted in social structure and processes. The specific trigger or shock that 'tips' the society towards a disaster is then understood explicitly in terms of its interaction with these social processes. Prominent commentators on societal collapse often highlight the 'self-inflicted wounds' that have led societies in the past to succumb to environmental stress, including over-exploitation of environmental resources and ecological degradation that raised significantly the risk for an ecological shock like a major drought or flood (Diamond, 2005; Ferguson, 2021). Viewing disasters in this way allows for the different components of these events to be teased apart and examined separately, distinguishing the arrival of stressors and, thus, periods of crisis from their broader social, political, and economic impacts.

Generally, in all of these perspectives, disasters and catastrophes are viewed as 'one-off' events. Some scholars, however, note that multiple such events often occur in tandem, either in the same geographic area and within a constrained time period or over larger spatiotemporal ranges, whether interacting, with each occurrence amplifying the impact of the others, or occurring in isolation (Alesch et al., 2009). Below, we scrutinize the most prominent terms describing these intersecting events, give our definitions, and offer examples to illustrate them. In the following section, we highlight what the concept of Polycrisis offers in addition to and beyond these more familiar terms.

4.1. Cascading disasters

Cascading disasters are 'extreme events in which cascading effects increase in progression over time and generate unexpected secondary events of strong impact' associated with 'sufficient forces or energy in the initial event to trigger the subsequent events in the physical system itself' (Cutter, 2018: 19–21). These tend to be 'at least as serious as the original event, and contribute significantly to the overall duration of the disaster's effects' (Cutter, 2018: 21), and "the combined impacts over time (damage, losses, disruption) are more severe than if they had occurred separately" (Committee on Hazard Mitigation and Resilience Applied Research Topics, Policy and Global Affairs, and National Academies of Sciences, Engineering, and Medicine 2022: 3).

Primarily used in the disaster, resilience, and emergency management fields, cascading disaster events exist in short-term temporal ranges without significant gaps between the initiation of related events. Cascading disaster events can be localized to a single geographic or political boundary, but can also be selectively interregional if the 'cascade' leads to increasing geographic scope for successive disasters; however, proximity in time and place must be present. The definition presented above indicates the multiplicative nature of cascading disasters, with the result of the interaction between events resulting in an impact/outcome more severe than just the individual events.

More than a decade ago, Japan experienced cascading disasters in the form of three rapidly occurring and catastrophic events known as the 3.11 triple disasters (Aldrich, 2019). On 11 March 2011, the Great East Japan Earthquake, which, at a 9.0 magnitude, is the largest recorded earthquake in Japanese history, hit the coast just off the northeastern Tōhoku region. Within moments, the slip fault triggered a 'major' tsunami (the highest on the tsunami warning scale), hitting land in less than 30 min in some places, which impacted a stretch of approximately 2,400 km of the Pacific coastline and devastated an area of around 535 km^2. The largest run-up wave reached a height of nearly 40 meters (130 feet) in the Iwate Prefecture. The earthquake and tsunami led to the deaths of around 19,000 people, injured thousands more, and entirely destroyed 128,753 houses (with 245,376 also partially destroyed). The tsunami obliterated many of the coastal protection structures, such as dikes and seawalls, and entire villages and towns were swept away. Throughout the affected regions, critical infrastructure such as emergency services, hospitals, transportation hubs, power supplies, and a multitude of public and government buildings were destroyed or incapacitated.

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Furthermore, the freezing conditions at the time and the snowfall brought on by the tsunami made rescue and evacuation efforts even more difficult. The third of the cascading disasters occurred at the Fukushima Dai-ichi nuclear power plant. After the earthquake initially triggered the automatic shutdown of the fission power generators, the tsunami waves, which breached the seawalls and then flooded the lower areas of several reactor units, disrupted both the emergency generators and the cooling systems. The plant suffered the meltdown of three of its reactors over 3 days, three hydrogen explosions, and the expulsion of radioactive contamination into the air for several hours afterward, forcing the evacuation of everyone in a 20 km radius of the plant. Aftershocks of the earthquake, several of which reached a magnitude of 6.0–8.0, continued for months after the initial quake, resulting in further damage and loss of lives. The Japan Cabinet Office announced that the economic expense of the earthquake and tsunami (though 98% percent is attributed to the tsunami alone) totaled around 16.9 trillion yen, making it by far the costliest natural catastrophe in history (Aldrich, 2019). The tsunami also caused considerable destruction in Hawaii and California and damaged coastal areas in French Polynesia, the Galapagos Islands, Peru, and Chile.

4.2. Compound disasters

Compound disasters are a combination of simultaneous small-scale events that directly influence each other to combine into a large-scale single disaster event (Committee on Hazard Mitigation and Resilience Applied Research Topics, Policy and Global Affairs, and National Academies of Sciences, Engineering, and Medicine 2022; Chen et al., 2011; Liu et al., 2022). Compound disasters have a simultaneous temporal range, with two or more events occurring at the same time but originating from unique sources. To be classified as a compound disaster, an event must, therefore, occur within a localized geographic range, able to be contained by geographic or political boundaries. The above definition of compound disasters necessitates these events be classified as multiplicative, with the interaction and feedback of the events directly influencing each other, resulting in cumulative effects greater than a single event.

A recent example of a compound disaster event is the desert locust outbreak across sub-Saharan Africa that occurred as the region also faced local effects of the global COVID-19 pandemic. Despite COVID-19 and the recent locust outbreak originating from separate sources, both had devastating impacts that were worsened by the presence of the other. The 2020 global COVID-19 crisis impacted numerous countries and caused significant loss of life and economic instability. The pandemic's economic repercussions may have pushed an additional half a billion people into poverty, undoing decades of progress and certainly affecting many communities in eastern Africa. Non-pharmaceutical measures like social distancing and lockdowns, while necessary to contain the virus, have also disrupted trade and pose a threat to food production and livelihoods.

In addition to the pandemic, desert locust swarms ravaged agricultural crops in 23 countries. These outbreaks have historically caused widespread food shortages and mortality. The most recent swarm, which began in July 2019, has become endemic in Africa and is compounded by the global focus on COVID-19, resulting in inadequate control measures (Rahaman et al., 2020). Eastern Africa has experienced the worst locust invasion in 25 years for Ethiopia and Somalia, and the worst in 70 years for Kenya. These migratory pests multiply rapidly, devouring large areas of vegetation and crops and putting the food security and livelihoods of affected populations at risk. The locust swarms continued to invade and spread across Ethiopia, Kenya, Somalia, and Yemen, despite ongoing efforts to control them. However, the recurring rainy seasons and regional insecurity impacted control measures and allowed for the further breeding of swarms, prolonging the crisis (Locust Upsurge in East and Horn of Africa — Final Report, 2022). The compounding effects of these dual catastrophes have led to famine, health hazards, and increased poverty in affected regions. Supply chain disruptions for pesticides and equipment to combat locusts were exacerbated by the pandemic. Urgent intervention was necessary from international and local agencies to address both crises simultaneously and prevent widespread hunger and suffering (Rahaman et al., 2020).

4.3. Recurring acute disasters

The term Recurring Acute Disasters (RADS) involves the sequential disasters that occur in the same location and create legacy conditions that shape the effects of subsequent disasters, though whether or how these events are causally linked to each other is not well specified in the literature (Pickett & Machlis, 2022). Based on Machlis's understanding of RADS, they should be thought of as having a long-term temporality, occurring over a multi-year period of time within the bounds of a specific geographic range. Therefore, RADS must also be classified as having a single, localized, geographic range within a specific geographical or political boundary. Importantly, RADS are inherently additive, wherein the results from one event increase risk for another event even if the impact of that second event isn't more severe than if it happened in isolation. Unlike cascading and compounding disasters, which refer only to physical/natural disasters (Cutter, 2018), RADS also incorporate the social and technological aspects of risk actualization.

Puerto Rico serves as a valuable case for applying Machlis's 2022 RAD framework. In 2017, Hurricane Irma struck the Caribbean near Puerto Rico, leaving in its wake widespread power outages, weakened energy grids, and infrastructure damage. However, other nearby islands faced harsher consequences, causing emergency supplies to be diverted to the highest-risk areas. Unfortunately, 2 weeks later, when Hurricane Maria made landfall, Puerto Rico was overwhelmed, resulting in inadequate emergency responses and the deaths of over 4000 individuals. Subsequently, Puerto Rico faced an island-wide drought in 2019 and a series of earthquakes in early 2020, which further weakened the already fragile infrastructure and exacerbated the challenges faced by the population (Pickett & Machlis, 2022).

5. What polycrisis offers beyond other concepts

What might be called the constituent elements of polycrisis are actually very familiar; environmental distress leading to acute ecological and economic shocks with disastrous consequences, one community or region experiencing a series of stressors over a prolonged period, each eroding capacity to recover from the last and so generating outcomes more intense than any event would have been on its own. These recurrent phenomena throughout history are treated by scholarship in various domains. Typically, though, as described above, these processes are viewed as localized and largely short-term or transient events. What stands out as fundamentally different about a polycrisis, then, is both the persistent heightened probability that a disaster will occur, because of the high risks appearing across numerous systems as noted above, as well as the increased likelihood that these more familiar concepts, cascading,

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compound, and recurring acute disasters, will result from the interconnections and feedbacks among these systems. In other words, our modern world of polycrisis is not offering a new, different type of disaster; rather, it is raising the specter that all of these disasters will occur more often, will keep propelling each other, and will tend to extend beyond any single system and spatial or political boundary.

The increasing interconnectedness between different social systems, economic, technological, cultural, geopolitical, etc., across multiple regions, along with rising vulnerability and exposure to various sorts of stressors (social and biophysical) creates very high risk and can generate strong feedback loops where the outcome from one crisis or shock impacts and bolsters others, leaving almost no space for recovery before the next one hits. While this type of feedback can be seen in other concepts such as cascading disasters or the RADS framework, again, in our view, it is the geo-temporal scope and causal entanglements between systems that distinguish polycrisis and which severely limit the prospects for recovery back to previous system functioning to a degree not generally experienced by events captured by these other terms.

Lastly, our current global polycrisis embodies the unique challenge of multiscalar human-driven Earth system stress; in other words, many of the biophysical trends we currently face are simply irreversible, which was not the case in any previous eras featuring poor or unstable climate conditions. There is no longer the prospect of returning to pre-industrial climate and ecological states, and the risk of crossing Earth system thresholds continues to increase. This places persistent and growing pressures on our other systems without much hope of relief; the best we can do is navigate what promises to be a now-permanent state of polycrisis and, with it, a fairly regular onslaught of resulting disasters. Figures 2a and 2b illustrate this concept. Some crises, perhaps typically those experienced in the past, result in a significant perturbation of systemic functioning when confronted with a significant shock, perhaps leading to a disaster, but after this, the system's 'capacity' returns to previous levels (Figure 2a).

In some cases, the risk faced by these systems may be increased even after it has rebounded to previous levels (Scheffer, 2009; Scheffer et al., 2012). However, a system that experiences a shock in the context of increasingly intense and consequential stresses never returns to its original state, even under ideal conditions (Figure 2b). We argue that the set of ever-present stresses, like those on multiple Earth systems as planetary boundaries are crossed, is a fundamental characteristic of our time. This is a critical insight, as shock-centric analyses and decision-making are highly likely to underestimate the actual disruption to systems and societies due to these ongoing forces. As CI researchers have dubbed it, such' trigger fixation' can belie large-scale systemic change by obscuring the nature and impact of longer-term stresses by focusing on mono-causal analyses in a rush to respond to the 'immediate threat'.

Another critical factor making polycrisis particularly difficult to navigate is the lack of capacity of different communities to organize large-scale efforts to manage or adapt to these stressors. Definitions of polycrisis to date have often recognized the possibility of including societal mechanisms such as governance. Indeed, European observers have long argued that politics in the EU are caught in a polycrisis environment (Zeitlin & Nicoli, 2021). Yet, we have only recently recognized the degree to which social trust serves as the foundation for organizational capacity and societal coordination. The depletion of our collective capacity to respond to crises as they arise, coupled with the erosion of trust in institutions, science, and political processes, generally impede our ability to coordinate activities and produce effective responses.

When public figures amplified mis- and disinformation about COVID-19 and vaccines, challenging the science behind masking and other tactics, the consequences were millions of preventable deaths (Fraser et al., 2021). This mistrust has been growing in many societies for years, even decades, as rising inequality and partisan conflicts have driven wedges between communities. As we discuss below, many historic contexts have shown similar patterns. In our current polycrisis, with its rapid pace, vast scope, and numerous stressors, societies have little time and dwindling resources to recover. Moreover, they often lack the social cohesion and trust necessary to maintain, let al.one improve, system functioning. (Carrington, 2023; Laybourn-Langton et al., 2019).

COVID-19 again serves as an informative example. The pandemic surprised many commentators, especially in the Global North, where it was inconceivable to many that such a major event could occur in the 21st century. It is a common *a priori* assumption in many fields that higher GDP and technological sophistication provide protection or resilience against many shocks and stresses, leading to the presumption that wealthy countries can afford to implement new technologies and guard against the more devastating outcomes from crises than less wealthy ones (Seth et al., 2011). Yet, in some respects, the reliance on advanced technology and the complexity of, and often rampant inequality within, the socio-political and economic systems that support the wealthiest modern countries lead to exceptionally high risk. It thus came as a surprise to many that the economic, social, and political disruption and excess death rates during the pandemic were actually higher in several of the world's largest economies, such as the USA, Russia, and Brazil, than in many industrializing nations (Rosengren, 2022; Wang et al., 2022).

In some cases, a seemingly positive systemic adaptation can actually increase risk from a greater reliance on vulnerable and/or exposed processes. For instance, massive investment in water-treatment capacity, particularly desalination plants, has recently improved water availability throughout the Middle East in nations such as Israel, the UAE, and Saudi Arabia. Indeed, in a short period, Israel transformed itself from an arid-region country reliant on water imports to a bulk exporter of water (Dreizin et al., 2008; Feitelson & Rosenthal, 2012). Yet, this transformation of the water supply systems puts the country at high risk of disruption, albeit different from traditional concepts of water insecurity. The country's deep dependence on desalination means a breakdown in infrastructure, whether intentional or not, would severely impact water distribution in Israel and its neighbors, a region of the world that is increasingly uninhabitable due to climate change. This could potentially exacerbate regional tensions over water resources and introduce new geopolitical vulnerabilities in an already fragile security environment. Increasingly, we recognize that some of the risks involved in a polycrisis arise partly from solutions to previous problems. Further, as our various interconnected systems continue to evolve, integrate, and adapt to challenges, and we become reliant on particular technologies or processes, they also become subject to all of the risks that such reliance in any system can bring.

6. Historical analogs

Having drawn out the core elements of what makes a polycrisis what it is, we can now ask how the concept might help us understand the dynamics of conflict and unrest in different temporal,

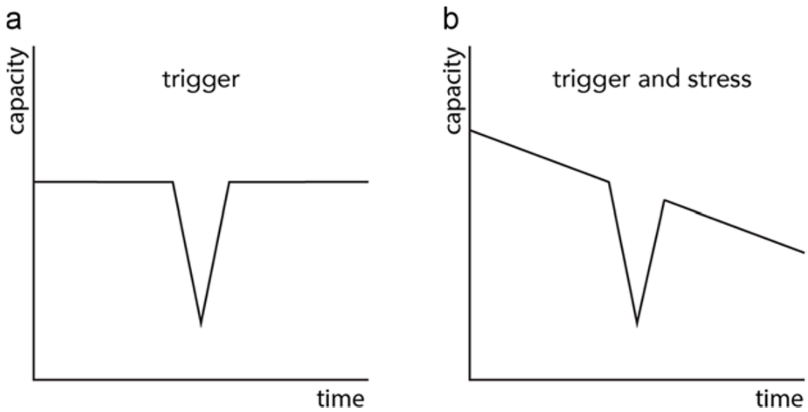

Figure 2. On the left side (2a), a system experiences a trigger (shock), resulting in a sharp, localized decrease in capacity (meaning the overall ability of the system to function), after which the system returns to its prior state; on the right side (2b), the ongoing presence of perhaps increasingly intense and numerous stresses prevents the system from returning to its prior state after the trigger.

spatial, and cultural contexts. Understanding how certain periods in the past resemble our own, as well as highlighting the ways that they do not, can help further refine our application of the concept to current challenges.

Thus far, we have primarily focused on what makes our current polycrisis unique and why the concept helps us better understand the true scope and nature of the global community's challenges. Yet, many societies in the past likewise faced high acute multisystemic crises and experienced major disasters as well, including stress due to changing climate regimes, degraded environments, and ecological shocks, as even Niall Ferguson (2021), a critic of the polycrisis concept, has stressed. It may even be argued that there were something like polycrises in the past, pinpointing periods when political, social, and economic systems were closely entwined at macroregional scales while biophysical stress contributed to periods of high risk and broadly interconnected crises (Holder et al., 2024; Hoyer et al., 2023).

This leads to a seemingly contradictory conclusion: some periods in the past exhibited many of the tell-tale signs of polycrisis, offering potential lessons and insights to help guide current responses; at the same time, our current moment offers certain novel features unprecedented in history which seem to call for radically new strategies and reimagined crisis management paradigms. Here we offer a few brief examples of period crises in the past which meet, or fall short of, the core diagnostic features of our modern polycrisis in different ways. In doing so, we wish mainly to help highlight the utility of the polycrisis concept for understanding and facing contemporary challenges, both the novel ones as well as those with historical precedent.

Of course, not every instance of some major disaster or interconnected set of events can or should be considered a manifestation of polycrisis (Lawrence et al., 2024). Certain societies may have experienced fairly severe dysfunction across multiple systems, which is not necessarily indicative or an instantiation of polycrisis. Ancient Rome, for instance, experienced a major, lingering crisis at the end of the Republican period (2nd and 1st centuries BCE) (Boatwright et al., 2012; Von Ungern-Sternberg, 2004). This crisis involved multiple systems, driven largely by unrest among large segments of the population suffering from a highly inequitable economic system, coupled with dysfunction in socio-political systems, including acute partisan conflict and frustration among the wealthy and powerful families seeking their place in the halls of power. Ultimately, this state of heightened risk and growing anger among many Romans spiraled into several bouts of major civil warfare, driven by the intense competition among ambitious, wealthy, and prominent citizens like Julius Caesar, Marc Antony, and Octavian (later Augustus) Caesar. While certainly a complex and tumultuous period, it lacks some of the critical elements that seem to comprise our current polycrisis. The turmoil was largely confined to Rome itself, despite its deep involvement in material and cultural exchange with states across Afro-Eurasia. This era also lacked acute, sustained pressure from Earth system stress, as this period is often considered one of favorable climatic and ecological conditions throughout the Mediterranean Basin; although Rome did face some ecological distress, including overexploitation of resources leading to deforestation, salinization, and some resource depletion.

Other historic periods resemble our current polycrisis somewhat more closely, though still with some crucial differences (Holder et al., 2024). The high Medieval period, for instance, arguably contains many key elements of polycrisis, as this time saw acute crises conspire across many different systems to generate devastating catastrophes across Europe and Asia, including the rise and spread of the Bubonic Plague. Despite popular misconception, the period was actually one of intense and deepening interconnection across Afro-Eurasia, resulting in continental-scale exchange networks like the so-called Silk Roads. Societies from China to Spain, the imperial Caliphates in North Africa to the smaller Kingdoms in the British Isles connected to and became increasingly reliant on long-distance exchange and communication (Abu-Lughod, 1991; Beckwith, 2009; Frankopan, 2015). This macroregional economic entanglement, though, was met with environmental stress, a prolonged period of abnormally low temperatures and unusual, inconsistent precipitation across Eurasia that occurred in two waves: one (dubbed the Medieval Climate Anomaly) from the 11th to 14th centuries, and an even more tumultuous period known as the Little Ice Age from the early 16th century and lasting until the late 18th (Degroot, 2018). Droughts, floods, and famines were frequent in regions affected by these unfavourable climate regimes.

Once the 'shock' of the bubonic pathogen struck, likely first somewhere in north China or Mongolia, the disease quickly spread through these robust exchange networks. Millions suffered, with some estimating that many countries lost over half of their populations, economies were disrupted, supply systems stressed, and conflicts raged throughout Europe and western Asia. Unsurprisingly, in such fraught conditions, the period witnessed many large interstate wars, such as the Hundred Years' War (1337–1453), as well as a number of major domestic conflicts, including in England, France, China, and the Ottoman Empire. Plague was recurrent over centuries until at least the 1600s, as poor climate conditions and the devastation of disease and warfare, along with the macroregional interactions that both conflict and exchange require, kept populations exposed and susceptible to further outbreaks (Kaniewski & Marriner, 2020). The pace and scope of these recurrent, interconnected crises left little time to recover or build capacity to reduce social fragility, causing each new disaster to inflame and exacerbate the impact of the next.

Most societies proved ill-prepared to handle these threats, notably being unable (or unwilling) to provide quick and effective relief during times of food scarcity, leaving many people in poor health and thus highly susceptible to infection and tensions at a boiling point, ready to erupt into violent confrontation. Some, though, did manage the period relatively better than others. For example, the Danish government supported innovation and experimentation with sea-faring, canal building, and other solutions to combat the colder, icy waters that were disrupting merchant activity, experiencing something of an economic boom due to these rapid adaptations (Degroot, 2018; Hoffmann et al., 2008). Likewise, the Ming and Qing dynasties of China maintained an extensive network of publicly supplied and managed granaries to provide famine relief in response to the frequent food shocks of the age (Shiue and Orlandi et al., 2023; Shiue, 2005).

In many ways, then, the high Medieval period across Eurasia resembles a time not that dissimilar from our own modern polycrisis. Critical differences between the times of Bubonic Plague and our current moment are that these conditions, while they transcended individual societies from East to West Eurasia, were not truly global, as much of the western hemisphere and parts of southeastern Asia and Oceania were largely disconnected from these events. Further, and perhaps more significantly, the climatic stressors carried by the Little Ice Age conditions were properly exogenous, a product of 'natural' dynamics of solar activity, volcanic eruptions, and other forces of the biosphere (though its precise causes are still not fully understood). Unlike our current age, these conditions were not driven by human activity, and although they lasted for centuries, they were ultimately *temporary*; conditions eventually returned to previous levels, ushering in the early modern period. We do not share this luxury with the permanence of the human-driven climate change we experience today.

Applying our framework to a diverse set of contexts can help reveal both the similarities and divergences between different experiences with crisis. Whether or not we refer to any specific period as a polycrisis, not a polycrisis, or something not quite a polycrisis but more like one than other moments is largely immaterial; the more critical point is that the concept of polycrisis with its focus on multisystemic interactions and causal entanglements helps us better understand these different periods and place them in comparison with each other and any number of other periods, earlier and more recent up to our present age. In our view, crises are best understood as existing on a spectrum, from clearly one-off, mono-systemic, locally constrained turmoil to multisystemic and recurrent disasters to macroregional social and ecological distress to the deep causal entanglements of our present age (Holder et al. In Prep). We thus contend that in the early 21st century, we are not in 'the' polycrisis as much as *a* polycrisis, though our current moment is unquestionably unique in many crucial aspects (Lähde, 2023).

More concerningly, the continuing and growing interconnectedness of our various social systems alongside the now clearly acute and irreversible devastation of climate change, biodiversity loss, and ecological stress do make it more likely than not that what in the past could have remained a localized disruption, military invasion of a neighbor, a regional drought or flash flood, a contained disease outbreak, will cascade into major, global catastrophe (McKay & David et al., 2022; Richardson et al., 2023; Schoonover & Smith, 2023). For instance, periods of major, prolonged drought and associated conflict have been implicated in the collapse of previously powerful past societies such as the Maya and other major classic Mesoamerican societies, the Angkor kingdoms in modern-day Cambodia, and a host of others (Acuna-Soto et al., 2005; Gill et al., 2007; Weiss, 2017); while devastating, these events remained fairly localized. In recent years, what are arguably short-lived and less severe droughts in East Africa, Australia, and other disruptions in major food producing regions have led to significant global food supply shocks, inflationary spirals, and widespread hunger (Gambhir et al., 2025; Headey & Fan, 2008; Lele et al., 2021). The world we inhabit today is fundamentally different from what existed in the past, making our modern polycrisis perhaps deeper than in previous eras.

The insights gained by exploring historic crises carry great potential value in helping to craft responses to our modern challenges, recognizing which interventions applied in previous eras might be successful in certain contexts today (or should be avoided) and where our novel challenges require something entirely new and untried before. While it occurred under very different circumstances, for instance, the intense partisan in-fighting that dragged the Roman Republic into major civil wars may serve as a lesson in the dangers of allowing so much wealth, political power, and military authority to collect in the hands of a privileged few. Likewise, the inability of societies during the High Middle Ages to respond to, let al.one prepare in advance of, major ecological shocks which impacted food security and health can provide a clear negative example for modern societies, as we stand to face similar shocks with increasing frequency and severity in the coming years – a lesson unfortunately not entirely learned by many countries during the COVID-19 pandemic as noted above (Haug et al., 2020). On the other hand, the world has never witnessed such global interconnection nor faced the prospect of unending, irreversible climate disruption, which calls for unprecedented solutions, though ones which can borrow from and adapt the principles expressed in successful reforms of the past (Hoyer et al., 2024).

7. Social cohesion, trust, and polycrisis navigation

A critical yet underdeveloped dimension of polycrisis is how social cohesion and institutional trust function as integral components of the causal entanglements that define our current challenges, rather than merely contextual factors. Social capital, the networks, norms, and trust that facilitate coordination, serves as a fundamental resource for governance across interconnected systems (Aldrich, 2019; Brondizio et al., 2009). During periods of heightened multisystemic risks, different forms of social capital directly shape response capabilities: bonding capital provides immediate support within communities, while bridging capital enables crucial cross-system coordination (Larsen et al., 2004).

This relationship becomes particularly evident when we examine how the deterioration of trust and cohesion among social groups of differing scales represents a fundamental vulnerability multiplier within the polycrisis framework. When misinformation undermines public institutions, the consequences cascade across multiple systems, creating precisely the feedback loops characteristic of polycrisis. The COVID-19 pandemic illustrates this dynamic clearly: erosion of trust in public health institutions hampered response coordination, intensifying health impacts while cascading into economic disruptions that further diminished trust, creating the self-reinforcing cycles characteristic of polycrisis dynamics.

The narratives through which societies interpret these interconnected risks significantly influence collective behavior change (Chabay et al., 2019) and shape how communities perceive and respond to complex challenges (Koch et al., 2021). Digital environments have transformed how these narratives develop and spread (Helgeson et al., 2022), often becoming vectors for fragmentation rather than coordination.

Understanding these dynamics helps explain why traditional crisis responses prove inadequate for polycrisis conditions. Historically, societies could focus on single-issue responses. England's response to the Black Death saw decreased land rents and increased wages, boosting economic growth post-plague (Borsch, 2005; Mayhew, 1995). Today, however, with multiple interconnected crises, single-use mitigation approaches prove inadequate. This limitation becomes clear in contemporary infrastructure responses: although Japan's sea walls mitigate tsunami impacts, they exacerbate flooding from riverine sources by trapping water (Aldrich & Sawada, 2015).

It is also important to recognize that crisis outcomes can have mixed effects. For example, following Japan's 3/11 triple disasters, some areas near Fukushima experienced a 'green retreat' with increased investment in renewable energy (Timothy & Aldrich, 2020). Similarly, during COVID-19 lockdowns, despite economic challenges, carbon emissions temporarily decreased, and some individuals reported mental health improvements.

What we need instead are what researchers call 'polysolutions' (Smith, 2022; Henig and Knight, 2023; Sawin, 2024): strategies with multiple levels of benefits across different systems. These approaches address multiple issues simultaneously rather than treating crises in isolation. Effective responses must address both narrative and social dimensions of system interconnection. Craig and Dillon (2021) emphasize 'storylistening' as essential for understanding how communities experience interconnected crises, while others demonstrate how post-disaster narratives influence both technical responses and broader social adaptations.

Central to this approach is the prioritizing of social infrastructure, spaces where social capital, trust, and cohesion form through interaction (Joshi and Aldrich, 2025). Social infrastructure encompasses community spaces, places of worship, social businesses, and parks. In these environments, people interact with individuals outside their immediate networks, creating bridging social capital that facilitates collaboration during crises (Fraser et al., 2022). Communities with a higher density of such facilities have demonstrated measurably lower disaster mortality rates than comparable communities, controlling for various confounding factors (Aldrich, 2023).

These facilities function as polysolutions by generating multiple benefits across different systems. Libraries, for instance, provide not only educational resources but also cooling shelters during heat waves, digital access for job applications, and safe spaces for vulnerable populations (Klinenberg, 2018). Similarly, educational initiatives like Farm to School programs connect food, health, economic, and biophysical systems from local to national scales (Hoyer & Chinh, 2020).

However, implementing such cross-system projects presents significant challenges, particularly as many democracies face coordinated misinformation campaigns against health policies and public goods (Bavel et al., 2021; Ruggeri et al., 2024). Rebuilding trust, therefore, becomes a prerequisite for generating support for major social investments. Addressing this challenge requires developing democratic resilience, the capacity to maintain equilibrium despite simultaneous stressors in governance and Earth systems, must develop through both bottom-up and top-down approaches (Bermeo, 2016; Lührmann & Lindberg, 2019; Waldner & Lust, 2018).

As we face escalating shocks and stressors, we must consider practical ways societies can manage these disruptions. For the short term, partial recovery may be possible for some system dynamics, such as restoring food access or rebuilding local trust in governance. However, over the medium term, repeated overlapping stressors will diminish the capacity of governments and NGOs to fully engage in resilience activities. We anticipate that temporary, not permanent, recoveries will become the norm. International aid networks will have less downtime between responses, depleting financial and administrative resources and reducing systemic response capacity.

While exploring comprehensive solutions exceeds this paper's scope, our framework highlights how threats to social cohesion and institutional trust exacerbate vulnerabilities across already stressed systems by undermining effective response capacity. This perspective recognizes that social dynamics are not merely contextual factors but integral components of the polycrisis itself.

8. Conclusion

This article has sought to identify the core characteristics of polycrisis, setting this state apart from other traditional, often monocausal or limited crises and their resulting disasters. We have seen the interactive elements that bring us beyond local, regional, and national, pushing the spatial scale to the macroregional and the global. Where in the past, societies had more limited degrees of interconnection with each other than today, global food, material trade, and transportation networks have interlinked societies ever more intensely. In past shocks and crises, the Earth system elements may rarely have surfaced or manifested to relatively constrained degrees, but in the modern age, the interface between humanity and nature has never been more porous. As we degrade ecosystems and their functions, melt the polar ice caps, eliminate tens of thousands of species of animals and plants, and heat the air and the oceans, zoonotic spillover and virus exposure rise, as does our constrained ability to grow food.

In explaining where our conceptualization of polycrisis differs from others, notably the recent CI report discussed above, we intended not just to expose the different arguments and viewpoints about the various essential features, but to stress the critical window in which decision-making has to occur in the face of elevated risks, understood separately from, though inexorably linked to, the outcomes stemming from that risk.

Ultimately, scholars can argue back and forth about terms and definitions for years in a typical academic fashion, but we believe it is more productive to 'agree to disagree' on some details and underscore points of convergence. First, our current age presents a number of increasingly intense risks and threats that, given the inexorable interaction and causal entanglement across social and biophysical systems at a global scope and varying timescales. Secondly, having a concept of polycrisis that recognizes these basic facts is critical for helping academics, policymakers, advocates, and the public better navigate these ever-present and growing challenges. As the CI report asserts, and as we have tried to bolster with our arguments here, 'The polycrisis concept, if effectively grounded in a scientific research program focused on practical steps to improve policy outcomes, can help us better address the world's interlinked crises. It can inform strategies to prevent the amplification, acceleration, and synchronization of crises and to respond when polycrises occur' (Lawrence et al., 2024, p. 25).

We offer a final conclusive note, spotlighting a concept that has received surprisingly scant attention, even in other works adapting a polycrisis framework, namely, the importance of social cohesion and institutional trust. Even during the worst shocks of the past, propaganda and disinformation were difficult to mobilize or co-opt, and most often came from organized governmental strategies to win hearts and minds at home and abroad. Now, domestic and foreign actors regularly take to radio programs, podcasts, social media, and cable news to fill the airwaves with deliberate nonsense, undercut authority, and delegitimize their political enemies. Information has rarely been more contested or fragmented while simultaneously extensive and instantly delivered. As a result, trust in government and science has plummeted, making collective action much harder.

Our current polycrisis sets up a new generation of challenges for residents and leaders alike. We can only hope that scholars and decision-makers alike will recognize that this era is unlike previous ones and will begin to deploy new understanding and tactics to navigate it.

Moving forward, we acknowledge that our conceptual framework, while advancing understanding of polycrisis dynamics, faces limitations requiring further validation. Further empirical analysis is essential to quantify and map the interconnectedness of crises (Delannoy et al., 2024; Mark et al., 2024), including the refinement of conceptual models and development of longitudinal studies tracking crisis patterns across system boundaries. Deeper investigations into historical analogues can provide additional valuable insights into recurring patterns, helping distinguish truly novel aspects of contemporary polycrisis from enduring systemic vulnerabilities. Furthermore, this framework would benefit substantially from comparative studies examining how practitioners conceptualize and operationalize polycrisis concepts in real-world decision making, building crucial bridges between academic theory and applied knowledge. Finally, understanding the specific mechanisms of adaptive governance related to polycrisis and examining power asymmetries in shaping vulnerability to and responses to polycrisis would strengthen understanding of equity and governance dimensions only briefly addressed in our current conceptualization.

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