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What comes after the polycrisis?

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Concepts and Perspectives

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Abstract

Non-technical summary. There is significant focus on the global polycrisis currently – and rightfully so, considering the threat to societies around the world that converging environmental, social, political, and economic challenges pose. However, little is said about what comes after the polycrisis. Are there methods to address the polycrisis in ways that would inherently help establish a 'better' post-polycrisis period (PPP) (i.e. preserving more of what sustains the many dimensions of human wellbeing while maintaining the integrity of the biosphere and local ecosystems)? This article explores that question, examining potential interventions that could lead to less suffering both during the polycrisis period and PPP.

Technical summary. This article explores how polycrisis interventions can be designed to be the most effective in setting up a better post-polycrisis outcome, while also improving the polycrisis response potential. It starts by setting up a 2×2 matrix to explore interventions that (1) improve outcomes during the polycrisis (but not the post-polycrisis period [PPP]), (2) improve outcomes post-polycrisis (but not during the polycrisis); (3) improve neither, and (4) improve both. The article explores some relevant and timely examples in each of the four quadrants, with particular focus on the quadrant in which interventions improve outcomes both for the polycrisis period and PPP. Particular attention is given, within that quadrant, to: reducing nuclear arsenals, population degrowth, economic degrowth, strengthening local agriculture, low-tech and appropriate technologies, and cultivating deeper respect for Gaia. In conclusion, the article recognizes that although it may be difficult, even impossible, to proactively and effectively plan for the PPP, some measures can be taken even now. Further, failing to put this on societal agendas means planning for and addressing long-term wellbeing will only occur by chance, increasing the odds of an extended period of crisis and/or a loss of key knowledge and civilizational advances gained.

Social media summary. Are there interventions to improve human and ecological wellbeing both in the polycrisis and the period that comes after?

> 'Listen, are we helpless? Are we doomed to do it again and again and again? Have we no choice but to play the Phoenix in an unending sequence of rise and fall?' – From *A Canticle for Leibowitz*

In the science fiction novel, *A Canticle for Leibowitz*, an order of Catholic monks dedicate themselves to painstakingly transcribing knowledge from the Machine Age – blueprints, instruction manuals, textbooks – mostly lost during a global nuclear war and the apocalyptic aftermath. Even as none of the monks understand any of the texts, they work diligently to preserve them for a future time, generation after generation. Six centuries later, the Dark Age ends and civilization returns – with scholars coming to the monastery to learn the secrets of the past. However, leaders pursue the same imperial pathways; scientists rediscover nuclear weapons and build them again, and this time, none survive the advent of this nuclear-triggered global polycrisis (Miller, 1959).

At this stage in the global polycrisis, it is hard to argue that civilizational collapse is still avoidable (see Box 1). (The global polycrisis, being made up of multiple converging crises, is by definition going to be asymmetric in its emergence. For some regions, the polycrisis is still forming, for others, it has already arrived, particularly in areas being disrupted by shifting water cycles (i.e. extended droughts, floods, and forest fires).) Humans have far transcended Earth's carrying capacity; they continue to grow in numbers, consumption, and impacts; and while there is much talk of an energy transition, it is more in word than deed (or in ways that shift the types rather than the totality of humanity's impact) (York & Bell, 2019).

What is rarely discussed is *what comes after the global polycrisis?* Assuming humanity doesn't completely destroy itself (e.g. through nuclear annihilation), there will be a time after the polycrisis. That is to say: when human numbers have returned to a level within the planet's carrying capacity, when economies (as limited as they might be) are once again solar based (as opposed to fossil energy based), and when humans have adapted to the new climates, ecosystems, biodiversity regimes, and social realities that have emerged.

Are there ways human societies can prepare for this time (whatever form it takes)? Are there ways that increase the odds that the rebuilding after the polycrisis *does not once again*

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Box 1. Increasing inevitability of civilizational collapse

Although it would be nice to imagine that humans are truly exceptional, with their large brains, language, and opposable thumbs, they are subject to the same laws nature requires of all life, particularly: *Do not undermine the carrying capacity of one's habitat* – whether by polluting it or depleting it (Catton, 1980). Unfortunately, humans have, through their cleverness, grown far beyond Earth's limits, and unlike the species' previous brushes with limits – which tended to be regional – this instance is global, with a whole host of planetary boundaries being crossed, with the vast majority of global wildlife being replaced by human and subordinate species' flesh (livestock and pets), with more human-made (or 'techno-') mass than biomass now created, and with humanity on track to experience global temperature increases that could trigger even further devastation (sea-level rise, ocean acidification, extreme weather, and reduced livability of the equator region) (Armstrong McKay et al., 2022; Elhacham et al., 2020; Greenspoon et al., 2023; Rockström et al., 2009; WWF, 2024).

The solutions being pursued, in truth, are primarily those that will sustain the current dominant civilization (corporate consumer capitalism [CCC] for lack of a better term), and are accelerating fossil fuel extraction and mining (including potentially of the deep seas), all while intentionally stimulating the growth of consumption by an ever larger and still growing population, such as through increased marketing and advertising spending globally, which grew from $1.28 trillion in 2020 to $1.63 trillion in 2023 (PQ Media, 2020, 2024). These solutions will not avert the climate crisis nor the biodiversity crisis, and could potentially cause new threats (such as hydrogen production accelerating climate change) (Derwent et al., 2006). Thus, barring surprise events, humanity is on the path toward some variation of societal simplification and contraction.

repeat modern civilizations' mistakes: treating Earth as an infinite pool of resources and waste sinks, forgetting humanity's dependence on this planet and the web of life humanity is woven into, and seeking empire over coexistence? Are there ways to respond to the polycrisis that increase the probability that remaining humans will embed a deeper respect and deference to the healthy functioning of Earth's systems into whatever new social orders take root, as opposed to doubling down on the controlling and managing of nature, such as through geoengineering schemes? (This acknowledges that following Earth's laws is superior to trying to control them, considering (a) the deep hubris for one species to exert itself as wiser than the whole that evolved over 4 billion years, and (b) humans have yet to demonstrate they know enough to effectively control Earth's system in ways that do not trigger dangerous surprises and/or have unintended consequences on other peoples, species, habitats, or regions.)

This article explores strategies that could make the post-polycrisis period (or PPP) 'better' (for both humans and non-humans, and life more broadly) and attempts to address some of these essential questions through this exploration. It will also look at a variety of strategies that make the polycrisis more survivable (or less bad) as well, and examine those that do both with an aim of encouraging prioritization of these options.

1. What is 'better'?

How can humans, with the time they have before systems unravel and most capital is either erased or directed toward responding and adapting to accelerating disasters, make changes in socio-economic systems to (1) reduce the suffering caused during the polycrisis: to humans, other species, and the totality of life (Gaia), (*Making the polycrisis less bad*); and (2) reduce the likelihood of causing suffering once civilization restabilizes post-polycrisis, again to humans, other species, and Gaia (*Setting up a better PPP*)? Some of these interventions will be at odds with both ends, some will only help with one or the other, but some can address both. Exploring and categorizing these interventions could help policymakers, businesses, civil society, investors, and funders to prioritize certain interventions over others.

Some potential interventions are mapped in a 2 × 2 matrix (see Figure 1). This is not an exhaustive list, but includes a variety of examples worth discussing (primarily chosen because of ongoing policy attention and/or potential transformational value). The article will discuss each quadrant briefly, before focusing on the key *Doubly Effective* quadrant to explore those interventions that could potentially make both the polycrisis period and PPP better.

	Not effective in making the polycrisis less bad	**Effective in making the polycrisis less bad**
Not effective in setting up a better post-polycrisis period	1) Sustainable Aviation Fuel 2) Carbon Capture and Storage 3) Geoengineering	1) Large Scale Renewable Installations 2) Seawalls
Effective in setting up a better post-polycrisis period	1) Permanently securing nuclear waste sites 2) Preserving knowledge of key societal innovations 3) Preventing destruction of the deep ocean	1) Reducing the global arsenal of nuclear weapons 2) Population Degrowth 3) Economic Degrowth 4) Regenerative agriculture 5) Low-tech, appropriate technologies 6) Cultivating deeper respect and understanding for humanity's dependence on the living Earth

Figure 1. Potential polycrisis interventions and their effects.

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2. Doubly not effective

At the most extreme, continuing business as usual – such as building more fossil-fuel-dependent power plants and expanding the consumer economy – will neither address suffering during the polycrisis (at least in sustainable ways that do not exacerbate suffering further) nor will this prepare future human societies for a post-polycrisis redevelopment (having turned vast swaths of natural capital into stuff). (An example: expanding the use of air conditioning to address extreme heat, which exacerbates climate change both through using more energy and more climate-changing refrigerants. In 2024, a councilman in New York City attempted to pass a law to require landlords to install and maintain air conditioning in their buildings (Howard, 2024).) Nor will the high-tech engineering solutions that prop up the CCC economic system (under the guise of buying humanity time to implement solutions). Some of these could even make the PPP worse. For example, although carbon capture and storage (CCS) may delay the release of CO_2, it uses energy and resources to do so, generating its own ecological and climate impacts. And some forms may actually do long-term damage. A new CCS venture by Vaulted Earth plans to inject manure, food waste, and sewage into deep injection wells. Although these may be a temporary source of methane or CO_2, they are Earth's future soils, lost permanently (in human time scales) in the planet's depths (Frontier, 2024). Further, CCS must have a leakage rate of 0.01% or less per year to attain the same benefits of renewable energy. This, however, may be overly optimistic (DiGiulio, 2024).

The same is true with geoengineering interventions: if solar radiation management (SRM) reflects sunlight, keeping Earth cool for a time, this would not prevent CO_2 from accumulating, leading to increased ocean acidification and other detrimental effects (including on those who did not necessarily agree to such schemes) (Nicholson, 2013), and could lead even to unexpected outcomes such as increased viral virility (Haddrell et al., 2024). And when society can no longer maintain SRM, assuming it did not use this time to shift to a low-impact economy and instead continued to sustain the CCC system, this could dramatically worsen PPP outcomes. (An interesting example of this can be seen through the inadvertent warming connected with reducing sulfur content of shipping fuels, which has led to a radiative forcing of $+0.2 \pm 0.11\ W\ m^{-2}$ across the global ocean (Yuan et al., 2024).)

Sustainable aviation fuel (SAF) and biofuels also fit in this category as they prop up unsustainable economic practices (i.e. flying for leisure) as well as redirect limited agricultural lands toward growing energy crops, which in turn will either reduce available calories (most likely for the lowest income individuals) or increase pressure to convert forests or wild lands into farms. Currently, the U.S. government is actively supporting SAF development, as are corporations. In 2024, the U.S. Department of Energy's (DOE) Loan Programs Office provided loan guarantees for two SAF facilities, each to the tune of $1.4 billion. One would convert corn into SAF, the other waste oils into SAF (both displacing other potential food uses of these inputs) (DOE, 2024a, 2024b). Worst of all, these types of interventions extend the social acceptance of firms that are inherently unsustainable, and as industries such as CCS grow, are creating new special interests that direct state and corporate resources toward less useful or even counterproductive actions.

3. Effective at softening the polycrisis (but not the PPP)

Although more difficult to identify interventions in this box, one example is large-scale renewable energy installations. Ultimately, these could help shift human society away from the use of fossil fuels and thus slow global warming, assuming the energy isn't just used to prop up the current CCC economic system. However, fields of solar panels, solar concentrating plants, and wind turbines may become unmanageable or unusable in a post-polycrisis scenario, depending both on how they are designed and built, and on the technological levels of future civilizations. Offshore wind, in particular, may become completely inaccessible as ships, cranes, and underwater cables require elaborate machinery to maintain. Small-scale renewables may be valuable in extending wellbeing in the PPP, assuming a level of technological know-how that allows for maintaining their usage.

Seawalls also fit here. These will take extensive investments and be limited in how much sea-level rise they can protect against. For example, New York City is considering a sea wall defense system, which would cost $119 billion and only protect against 2 ft of sea-level rise (Barnard, 2020). If these delay the inevitable loss of cities by just a few decades, this translates to a high level of expense for little gain, begging the question of whether these dollars (and carbon-based resources, such as cement) could not be spent better in other ways. Research after the 2011 tsunami in Japan found that building social infrastructure (e.g. community centers) was more strongly related to better recovery outcomes than building seawalls was (Fraser et al., 2021). Further, the benefit of seawalls may come at the direct expense of certain populations in a city, such as in Jakarta where over 200,000 slum dwellers' homes may be destroyed for construction of coastal protections currently being considered (Yarina, 2018).

4. Effective at setting up a better PPP (but not softening the polycrisis)

Some interventions will do little to cushion the polycrisis and thus in all likelihood will have difficulty in securing resources or interest. However, they remain important, particularly in the case of a severe PPP.

Perhaps the most obvious example is cleaning up and securing nuclear waste sites and nuclear power plants as they are decommissioned (which, as many of the first generation of these are coming to the end of their lifespan, could be soon – possibly before the polycrisis period unfolds in earnest). The United States has 54 active nuclear power plants (consisting of 93 reactors) (Energy Information Administration, 2024) and 80 sites where nuclear waste is stored (Congressional Research Service, 2020). Each of these could cause ongoing and invisible suffering for generations of unsuspecting neighbors, nomads, or scavengers. Understanding the multi-millennial scope of this problem, the U.S. government even hired anthropologists to explore the best ways to communicate with future civilizations that may no longer speak English (Piesing, 2020). However, although that was a good question, very little has been done to actually clean up these sites, due to difficulties in siting a deep geologic nuclear waste repository. (Finland, which has successfully built a repository, may offer a useful case study in determining how other countries could effectively store their nuclear waste (El-Showk, 2022).)

In 1990, Joanna Macy proposed creating nuclear guardianship groups – those who can, like monks of old, pass on oral history and knowledge of these danger zones (Macy, 1990). Even if it is no longer possible to clean them up, those designated bodies could provide the knowledge to surrounding communities of what once was there and why they need to stay away. But ideally, investment will be made now in cleaning up waste and nuclear

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energy sites. (Ironically, instead there is an active push to re-open and expand nuclear power plants in the United States, driven by growing electricity demand. This includes re-opening a reactor at Three Mile Island (Microsoft, 2024), and sizable investments by companies (Google, 2024) and the Department of Energy in small modular reactors (DOE, 2024c).) The Ukraine/Russia war shows how risky nuclear power is. If conflict is part of the polycrisis (a high likelihood), combatants (state or non-state) could destroy nuclear plants either intentionally or by failing to provide electricity, or could use them as dangerous-to-assault fortresses. Nuclear Guardianship groups could be seeded and supported by diverse stakeholder groups of local governments, community leaders, and even religious organizations (which have a longevity few other institutions have) as an investment into the long-future. However, research turned up only one active Nuclear Guardianship working group, the Rocky Mountain Justice Center (2024), in Boulder, Colorado.

Also key will be preserving those simple technologies and techniques that could be lost during significant societal disruptions and state failures. These include everything from water purification, pasteurization, sanitation, midwifery, and basic medicine (both preventive, such as nutrition and vaccines, and curative, such as antibiotics and bone setting). Midwifery, for example, requires high levels of skill but uses almost no resources and minimizes the risk of infection and operational risks, critical in the low-tech PPP. In several post-Soviet countries, one can see the decline of healthcare, where complex medical services are only available to those with the resources to travel to other countries with better medical systems. In the case of a global polycrisis, far fewer will be able to afford medical tourism (and travel may be limited), thus preserving medical knowledge will be critical. Groups such as the Hesperian Foundation (2024), which has published and distributed books including *Where There is No Doctor* and *Where There is No Dentist*, are interesting starting points. Exploring how to keep this information distributed (and improved upon) to future apprentices even as global communications becomes more limited is critical. (Hesperian prints these guides as books, which may prove far more valuable in the polycrisis/PPP, where Internet access may be limited.)

Finally, protecting the deep sea may prove deeply valuable, not just as a stabilizing force in climate regulation or future discoveries, but because of the deep ocean's pivotal role in evolution (Boag et al., 2018). If the very worst scenarios of the PPP play out (such as global nuclear conflict, or runaway climate change) and trigger vast losses in biodiversity, having an undisturbed deep ocean to reseed Earth's biodiversity may be essential (similar to an appendix recolonizing digestive tracts with gut microbiota). Thus, it is imperative to pass laws, conventions, mobilize investors to keep capital away from those that would pursue deep sea mining, and encourage companies to promise not to use minerals from deep sea mines. Further, factoring in total ecological costs, deep sea mining could actually cause $500 billion in value destruction (including $30–132 billion in mining industry losses) if pursued (Planet Tracker, 2024). Therefore, preventing deep sea mining would be a no regrets opportunity, even if most of the benefits are realized in the PPP.

5. Doubly effective

As there are limits in mobilizing both attention and resources for societal interventions, addressing this quadrant may make most sense, as it has potential benefits in reducing suffering both during the polycrisis period and the PPP.

5.1 Dismantling nuclear arsenals

Above all else, reducing nuclear arsenals and the potential for nuclear war should be a top priority. Even a limited nuclear exchange of a hundred small nukes could cause billions to die from famine (Witze, 2020). A larger exchange could be a civilization-ending event. As systems destabilize, as political leaders radicalize, the probability for nuclear conflict is increasing. However, reducing total arsenals (which currently total over 12,000), and strategically limiting their placement could help in both the polycrisis and PPP timeframes (FAS, 2024). One politically feasible example, proposed by former military analyst Daniel Ellsberg, would be for the United States to dismantle its land-based Intercontinental Ballistic Missiles, keeping its plane-based, and submarine-based missiles intact (and more than enough firepower to deter a first strike) (Solomon, 2021). Dismantling siloed missiles could prevent multiple states from having their own nuclear arsenals in the case of a second civil war in the United States (as mobile nuclear warheads could be moved away from conflict zones and submarines controlled). Although the Soviet Union broke apart non-violently, and the Soviet arsenal was moved to Russia, it is hard to imagine a scenario where nuclear weapons are voluntarily relinquished by U.S. states. This not only could maintain some deterrent stability, but could also trigger more dangerous conflicts regionally. Dismantling these missiles also could provide a supply of uranium for remaining nuclear power plants, reducing the need for continuing toxic uranium mining. This has already been successfully modeled: after the fall of the Soviet Union, via the Nunn-Lugar Act, Russia and the United States cooperated to destroy over 9000 nuclear warheads and used the de-enriched material for reactors (Center for Arms Control and Non-Proliferation, 2022).

5.2 Promoting degrowth

As the global polycrisis stems from humans living beyond Earth's carrying capacity (thus undermining the systems they depend on), *degrowth of both human numbers and the global economy is essential.* Actively promoting small populations has become increasingly taboo, and many countries continue to actively promote pro-natalist policies, encouraging mothers to have more children to reverse their slowing birth rates. In 2024, Russia even passed a law making it illegal to promote 'childfree ideology', charging violators heavy fines for 'encouraging interest in childfree lifestyles' (President of Russia, 2024). But shifting population trajectories from the likely 9.7 billion by 2050 to 8.5 or even 9 billion would reduce humanity's ecological impacts significantly (United Nations Department of Economic and Social Affairs, Population Division, 2022). Methods for justly nudging slower population growth abound: providing comprehensive sexuality education (Kaidbey & Engelman, 2017), offering unimpeded (and free) access to family planning technologies, and normalizing a smaller family size norm could help accelerate the stabilization and eventual reduction of the human population – these alone could make significant progress (Weisman, 2013). (Although beyond the scope of this article, Alan Weisman provides a strong case study on how Iran reduced its population growth without coercion but by providing access to family planning nurses and clinics in each village.) A smaller population

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will not only help reduce the severity of the polycrisis, but by its nature limit total human suffering during the polycrisis and the PPP.

Humanity's dependent species also need to be more actively managed. Livestock and pets are a heavy burden on Earth's systems, and shifting diets away from meat and dairy and denormalizing 'pet parenthood' is an essential preventive measure. Currently, dogs have larger ecological footprints than some humans (complete with travel, medical care, even doggy hotels), which is not only a deep injustice, but as resources shrink further, will put increasing pressure on the lowest income individuals for access to food (Vale & Vale, 2009). Normalizing smaller breeds, fewer pets per family, and even shared pets could be a first step, but even greater limits are needed (Assadourian, 2014). (During the 2008 recession in the United States, there were many media stories of families abandoning pets. Abandoned dogs could become dangerous feral populations in a PPP, a reality already faced in some developing countries.)

As difficult as addressing population growth is, degrowing the global economy may prove even harder. Yet this too could have significant benefits – not just to overtaxed ecological systems, but to communities. Many people suffer from overwork, lack of healthcare, and side effects of a highly unequal economic system (Assadourian, 2012). Better distribution of wealth, through increased taxes and improved state services (from water and sanitation and healthcare, to public libraries and increased labor rights, such as a 4-day work week) would have significant benefits in slowing down the frenetic pace of modern life. There is a vast literature now on degrowth, including articles exploring many potential interventions to normalize it (Schmelzer et al., 2022). One recent journal article even catalogued 530 policy proposals to expand the degrowth agenda (Fitzpatrick et al., 2022). The challenge, of course, is degrowth in the context of a corporate-dominated growth-based economic system, but discussions on degrowth are starting to occur even in corporate settings (Business for Social Responsibility, 2024). Choosing to degrow the economy now and using freed-up resources to improve both systems that provide for human wellbeing as well as ecosystem functioning (see below) could increase societal resilience during the polycrisis and ensure that more ecological capital comes through the polycrisis unscathed, making the PPP less dire.

5.3 Locally cultivating regenerative and productive farms and forests

Regenerating degraded natural areas is another avenue to improve both the polycrisis and PPP, particularly in ways that are productive: for example, regenerative agriculture and food forests. Regenerative agriculture, which can improve biodiversity, increase soil carbon, lower toxic inputs, and increase farmer wellbeing is a key intervention (both at small and large scales) to improve sustainability and resilience of the food system. Food forests (i.e. integrating trees bearing edible fruits and seeds in forests) could also provide local sources of food during the polycrisis (where global food trade will most likely be disrupted) and help preserve the value of forests (such as during the polycrisis where they may be seen primarily as a source of fuel). For example, during the Great Recession, many parks and forests in Greece were illegally logged to provide wood for heating homes (Stamouli & Bouras, 2013). Even cities could be a potential location to develop food forests. A recent estimate found that cities could store 1 gigaton of carbon a year by 2050, partially by improving soils and increasing tree cover. If those trees are fruit- or nut-bearing, they could provide a source of food, even during broader trade disruptions (Rodriguez Mendez, 2024).

5.4 Investing in the development and implementation of appropriate technologies

Developing appropriate technologies can also have benefits in both the polycrisis and PPP. Cooking technologies are a good example. For decades, environmentalists have attempted to promote the value of solar cookers, which reduce fuel wood collection (and the labor burden, risks, and deforestation that come with this) and utilize the free and abundant energy of the sun instead (Mosses et al., 2023). It has not been easy as it is a new technology that cooks food differently and, frankly, because relatively cheap alternatives are still available (free wood and cheap kerosene). As alternatives become completely unavailable, certain technologies will mean the difference between suffering and survival. A solar oven can also be used to purify water and turn potentially inedible roots, nuts, animals and insects into edible meals.

Solar cookers are just one example. There are many websites, magazines, and organizations dedicated to low-tech technologies and everything from bicycles to simple wind turbines could play a key role in the future of food processing, laundry, and even home heating. (The use of a wind turbine can generate friction through the churning of a viscous liquid, which can be used for heating one's home (De Decker, 2019).) These could reduce ecological impacts, particularly in developing countries where western pathways have yet to become as deeply locked in, and may prove more resilient as well as more sustainable as societies navigate the polycrisis and PPP. However, without significant investment, these will in all likelihood remain on the periphery until it is too late to effectively research and deploy these.

5.5 Accelerating cultural shifts

A final intervention – the most difficult to both quantify and invest in – is the necessary cultural shift to help humans understand that they are part of, and utterly dependent, on Earth's systems for their wellbeing. Continued disconnection and abuse of Earth's systems will lead to devastation that ultimately will bite back against humanity. Not cultivating respect and deference further increases the risks of seeing geoengineering or mastery over Gaia as viable solutions, rather than high-risk and hubristic actions. Embedding Earth reverence into existing religious ideologies (Gardner, 2010), cultivating new Earth-centric spiritualties (Assadourian, 2013), promoting ecocentric education and media (Assadourian, 2017), and even encouraging local community efforts such as forest bathing can all play a role in cultural transformation that will help normalize a more connected and deferential way of relating with Gaia.

6. Moving forward rather than in circles

Ultimately, just as humans have failed to have the foresight to avoid the polycrisis, they may also fail to act to lessen the severity of the polycrisis (let alone the PPP). This article cannot address how to overcome that resistance, but cultural pioneers, who strategically utilize the cultural power of the institutions they have influence over to normalize sustainability, will play an important

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role in drawing attention and resources toward some of the more constructive interventions (Assadourian, 2010). And, if successful, they could well help reduce the suffering of many humans and non-humans in both the polycrisis period and PPP. If humanity fails, in all likelihood, we'll still find our way through the polycrisis, but the PPP may bring us not into a new balance with the planetary systems we depend on, but onto a path with another global polycrisis around the bend, just as in *A Canticle for Leibowitz*. Planning now for the PPP could help ensure that humanity only experiences one global polycrisis and no more.

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