

Regenerative Nature-Based Solutions: The Missing Link in Solving the Climate Polycrisis

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Our Failing Paradigm for Climate Stabilization

The failure of our current approach to reversing climate change is evident in every major national and international assessment—and in our own direct experience of escalating climatic extremes. This failure is not simply the result of insufficient implementation of known solutions. It is a vivid illustration that *our understanding of the causes of climate change is inadequate*--and therefore so too are our solutions. Specifically, we have dramatically underestimated the role that living systems' degradation has played as a cause of the escalating climate crisis and other systems' collapse. As a consequence, we have overlooked or under-valued the enormous potential that regenerating ecosystems can play in not only stabilizing climate, but also “polysolving” a host of interrelated crises: biodiversity collapse; food insecurity; the largely looming global threat of mass displacement and migration; and the rise of political extremism.

In the quest to find a clear and actionable path to reverse global warming, most climate change analyses over the past 50 years have focused on a simple carbon math equation: increasing fossil fuel combustion leads to increased atmospheric CO₂ which leads to global warming. The solution is presumed to simply be the reverse: decrease fossil fuel combustion, reducing release of CO₂ into the atmosphere, and thereby reduce global warming. This carbon math paradigm has resulted in a largely exclusive focus on simply eliminating the combustion of fossil fuels and hastening the renewable energy systems transition as “the solution” to climate change. While an essential part of climate stabilization, this approach will be insufficient without recognizing and integrating the enormous role that natural systems play in climate regulation. Moreover, this narrative has diverted both attention and vitally needed resources from the critical task of regenerating the climate stabilizing capabilities of the over 70% of the terrestrial world that is now considered deeply degraded.¹

A growing body of science is demonstrating that while combustion of fossil fuels is a significant source of atmospheric CO₂, land degradation has been the first major step in climate destabilization. A recent analysis projects that land and soil degradation are projected to have contributed a third or more of all of the excess CO₂ in the atmosphere.² This “decarbonization” of the living world in turn disrupts water and terrestrial energy cycles in ways that compound global warming and simultaneously magnify drought, desertification, species die-offs, food and water systems disruptions, and human community destabilization and migration. While most attention and coverage of climate change focuses on the social and economic impacts of extreme climatic events, *climate-forced displacement and migration may soon become the most globally destabilizing consequence of our inaccurate climate paradigm and its ineffective solutions.*

¹ <https://phys.org/news/2018-06-world-atlas-desertification-unprecedented-pressure.html>.

² Sanderman et al. 2017. “Soil carbon debt of 12,000 years of human land use”. <https://www.pnas.org/content/114/36/9575>

According to a 2022 UN report, as many as 700 million people are at risk of being displaced by 2030 due to drought and other climate change magnified factors. As we have seen in settings like the mass migration which took place in Syria--likely fueled in part by climate change magnified social tensions--people will understandably search desperately for safer homes as their ecosystems fail around them. These large-scale relocations then place enormous logistical, social, economic, and ultimately political stresses on the surrounding more relatively stable societies people attempt to flee towards.³

These lethal blind spots in our recognition of the consequences of land and living systems' degradation on climate change are due in part to the ways that climate science and climate risk assessment have historically been shaped: primarily by Western/Northern hemisphere reductionist scientific paradigms. Traditional and Indigenous knowledge traditions that recognize the intersections between ecological systems and environmental and climatic conditions must now be recognized, recentered in this effort, and respected as foundational to a new integrated paradigm of climate action. We can now integrate these traditional and indigenous knowledges and practices with our growing capabilities to monitor and coordinate action at bioregional scales. This will require a networked, locally-based implementation framework. In so doing, **we can reverse climatic instability and take a more integrated approach to the polycrisis of interrelated system breakdowns—biodiversity, food/water insecurity, and community/political collapse.**

False “Solutions”

Unfortunately, even where there has been a focus on using “natural climate solutions⁴”, these approaches predominantly focus on treating living systems as essentially biological carbon drawdown machines. In one such proposal - “bioenergy plus carbon capture and storage” (BECCS) - vast areas of land that together would be larger than the area of Mexico are being proposed for use as single species plantations. Trees or other plants grown there would be burned for energy and the resulting carbon “captured” would be pumped underground.

These enormous, capital-intensive, yet still theoretical systems and infrastructures would not only require massive amounts of groundwater, pesticides, fertilizers and other chemicals, they would inevitably displace countless communities—human and more-than-human—as they simultaneously concentrate the development subsidies, risk buy-downs and other economic incentives and prospective benefits in the hands of a small number of individuals and their corporations. Shockingly, bioenergy plus carbon capture and storage (BECCS) is a central component in all of the strategies proposed by the UN’s Climate Scientists (IPCC) for keeping global temperatures below 1.5°C.

This form of “natural climate solutions” simply emulates the mechanistic approach that is evident in the countless other technology-based proposals now being proposed by research centers and technology consortium—from massive direct air capture devices (DAC) to enormously risky attempts to use chemical agents to induce greater

³ <https://news.un.org/en/story/2022/05/1118142>

⁴ In October of 2022, the UN Environment Assembly published “Nature-based Solutions: Opportunities and Challenges for Scaling Up”. This document clearly differentiates “natural climate solutions” as focusing primarily on carbon capture, while “nature-based solutions” is oriented towards a larger and more integrated set of outcomes including diversity, resilience, and equity/social justice. See: <https://www.unep.org/resources/report/nature-based-solutions-opportunities-and-challenges-scaling>. Page 17

cloud cover. Such unproven technology centered “solutions” are poised to receive trillions of dollars of government subsidy and “de-risked” investment capital for schemes whose prospects and claims are widely disputed and decades from projected readiness.

A Regenerative Nature-based Development Alternative

There is, however, increasing evidence and an emerging awareness that nature-based approaches to climate change can reverse some of the worst impacts when focused on regenerating the lost capacity of biodiverse, fully functioning living systems. A recent landmark study estimates that regenerating the biological capabilities of just 30% of the Earth’s land area now considered deeply degraded has the potential to stabilize and eventually reverse not only climate change, but a whole constellation of related existential crises including the biodiversity, food/water security, and desertification.

However, it is important to differentiate between a whole systems approach to nature-based solutions from efforts that seek to maximize a single capability of natural systems such as carbon capture, often at the expense of both biodiversity and ecological and social resilience. The bioenergy plus carbon capture and storage (BECCS) example above is just one of many such examples. To differentiate, we use the term *regenerative* nature-based solutions (RNbS)⁵ to highlight approaches that are co-designed to enhance local ecological, social and economic benefits while also contributing to broader climate stability objectives. In contrast to the biologically diminishing approaches of a monoculture-based BECCS system, for example, an RNbS would integrate regenerative agricultural practices that restored water cycles and the potentially significant landscape-scale cooling and carbon capture that could be accomplished—while producing a local economy enhancing food and fiber resource. In an urban context, an RNbS urban forestry initiative would focus on planting an integrated set of forb, shrub and tree species—including food producing species and native/pollinator varieties—to use biodiversity to enhance the productivity, resilience and range of ecosystem services provided by a more fully functioning urban forest.

With this approach, a *regenerative* nature-based paradigm of climate action offers a clear, accessible, and shovel-ready approach focused on mobilizing the massive and largely unrecognized regenerative capacity of the larger living world—and hundreds of thousands of human communities working with it. Regenerative nature-based solutions (RNbS) also have the potential to unlock the enormous potential of the countless people and human communities that have been alienated, marginalized, detained, incarcerated, confined to refugee camps or in multiple other ways disenfranchised from their innate capacity to contribute as part of meaningful living system regenerating efforts. These regenerative nature-based development solutions must be primarily accomplished by community-based initiatives working in collaboration with nature-based systems to repair local water cycles and reverse desertification, restore biodiversity, and create stable livelihoods and living conditions for hundreds of millions of people. Co-designed effectively in collaborations between local communities, subject matter specialists, and regional and national and international coordination bodies, these actions will also simultaneously mitigate and eventually reverse global warming.

⁵ We recognize that in many cases, these extractive and degrading actions have been driven by colonial or neo-colonial political and economic systems that must be recognized and addressed for these new forms of locally-based regenerative development to be successful.

We already have evidence that demonstrates the rapidly realizable effectiveness of a regenerative nature-based solutions approach at scale. There is a growing body of literature, case studies, and science-based assessments documenting how sustained investments in regenerative place-based, community-led, nature-based solutions can restore stable life-sustaining and social systems and dramatically reduce forced displacement in as little as 1-to-2 decades. All of this can be done while enabling people to remain in place, build socio-ecological cohesion, and be engaged as the workforce for the restoration of their local ecosystems. Implemented at scale, this nature-based regenerative redevelopment approach can have massive systems stabilizing influences—climatically, biologically, social, and economically.

Climate, Biodiversity, and the Economic Benefits of Nature-Based Regenerative Development

A landmark 2020 geospatial analysis from the International Institute for Sustainability projected that implementing regenerative nature-based solutions in 30% of the world’s high-priority remaining ecosystems could save 71% of remaining terrestrial species from extinction and sequester an amount of carbon equivalent to half of all the CO₂ released since the Industrial Revolution. This analysis underscores the emerging recognition that all three of the 1992 UN Rio Summit Conventions—the Convention on Climate Change, the Convention on Biodiversity, and the Convention on Combatting Desertification—must now be pursued through a coordinated approach if we are to address the intersectional polycrisis threats we now face. This study also highlights the economic risk of delaying investments in nature-based solutions, ***likely doubling the cost of restoration if these actions are delayed.***⁶

Conversely, according to a 2020 World Economic Forum report, worldwide implementation of nature-based solutions is projected to *generate* over \$3.5T in annual business opportunities and over 190M jobs globally by 2030. Significant climate, land regeneration, and biodiversity enhancement potential also exists through *urban* nature-based solutions initiatives, projected to create over 59M jobs by 2030—equivalent to 1.5% of the projected global labor force in 2030. The growing recognition of this scale of opportunity is raising calls for similar, more localized analyses of nature-based solutions that can provide a critical foundation for subnational (City, County, State) policy approaches to creating economies that provide long-term support to this workforce in the nature-based climate action sector.⁷

However, only a coordinated global regenerative nature-based solutions (RNbS) movement will be sufficient to reverse the rapidly deteriorating climatic, ecological, and social conditions that are in evidence worldwide. No country, no society, no class of people can escape the consequences if we are unsuccessful. However, unlike past efforts at coordinated top-down global action, regenerative nature-based development will need to pioneer new approaches that empower far greater participation, agency and authority for action with and within local communities—both human and more-than-human. Communities must become the essential foundation through which this regeneration of the Earth’s innate abundance capacities can be restored. Ultimately, all action is local.

⁶ <https://www.iis-rio.org/en/publications/nature-global-priority-areas-for-ecosystem-restoration/>.

⁷ https://www3.weforum.org/docs/WEF_The_Future_Of_Nature_And_Business_2020.pdf

Recommendations for Reorienting Global Climate Action and Resources towards Regenerative Nature-based Solutions

Facing what currently seems like an overwhelming convergence of related crises, our prospects of success may appear bleak. But as numerous historic and contemporary case studies of regenerative nature-based solutions demonstrate, the complexity of the Earth's living systems embodies a resilience and regenerative capacity that likely far exceeds what we currently comprehend or can predict.

While humans have unquestionably contributed to the current degraded state of the Earth's systems, we have an equal restorative capability when serving as collaborators in regenerating our planet's natural ability to mitigate and adapt to unprecedentedly rapid climate change. Much of what is needed for this work to succeed is already known. We must now grow the data, know-how, funding, and infrastructures to support and expand the ability to stabilize climate and larger living systems worldwide.

The full cost of this work will be in the trillions of dollars invested over decades. It will require a coordinated global movement that collaboratively implements a regenerative nature-based solutions development agenda. To expand and accelerate the potentials of this urgently needed RNbS approach, we offer five recommended initial action steps:

1. Integrate the three UN Conventions in a single coordinated science-based assessment body and create a civil society working group comprised of multinational representatives from all sectors and classes of society—public, NGO, indigenous, industry/private sector, academic—to advise in this integration process.
2. Coordinate the development of national and subnational assessments of land/ecological conditions – in coordination with local/regional community advisory bodies inclusive of all major stakeholders – to identify areas of critical ecological breakdown, particularly in relation to the displacement or marginalization of populations.
3. Create multi-disciplinary teams to conduct a global search to identify and document examples of regenerative nature-based climate solutions and codify them into a foundation of evolving knowledge around how human communities can achieve systems-transforming scale change.
4. Facilitate cross-sector, multi-stakeholder innovation and co-development of regenerative nature-based development solutions at the subnational scale. Work with these sectors to accelerate the identification of implementation sites with the greatest potential to polysolve climate, biodiversity, land degradation, and community stabilization objectives. Chronicle and disseminate effective strategies to support communities working together to stabilize their local ecosystems enabling them to stay in-place.
5. Convene an international Regenerative Nature-based Development Finance Task Force to advise on new global-to-local financial frameworks to oversee decades of sustained investment—much of which will have to be untethered from the now-popular notions of financializing regenerative investment in various forms of unsustainable repayment schemes.

Conclusion

To fully implement this living systems-based paradigm and approach we will need new economic infrastructure. We cannot expect--as old paradigms of "development" have demanded--that degraded ecosystems and disinvested communities can pay for their own repair. We must recognize that the massive investments needed are an unpaid obligation that all who have benefited from the use of these living systems must now contribute to. This may seem politically difficult or impossible to achieve in the current moment. However, if effective multi-national organizing is done to align, unite and mobilize the billions of people who could benefit from a global regenerative nature-based development agenda, a new political space could be created enabling such essential economic restructuring. Nothing short of this is needed if we are to succeed in regenerative actions at scales sufficient to reverse our current trajectory towards an unlivable future. Doing so, we can literally grow a living hope and new pathways that dramatically expand the scope of resources, capabilities, and allies working together to regenerate a more stable, equitably abundant, and peace-filled world.

This paper has been condensed to provide a summary overview of a living systems-based approach. A full version which includes extensive citations, references, and illustrative images documenting the arguments put forward in this version can be found at: <https://naturebasedclimate.solutions/news/polycrisis-solutions>

ABSTRACT

The current carbon math paradigm has failed us by oversimplifying the complex dynamics of the living systems of our planet and prioritizing a limited set of "solutions". An understanding of nature's capacity for regeneration and resilience— and communities' role in these processes— gives us a blueprint to stabilize the climate and usher solutions to numerous interconnected environmental and social crises globally. We must invest in Regenerative Nature-Based Solutions as public goods with extraordinary public benefits, not as traditionally profitable schemes the likes of which dominate current climate innovation and financing. While politically difficult, the uphill battle to bring these solutions to scale is not only necessary but also immensely possible in light of the billions of people who stand to benefit and whose voice, wisdom, and determination can be mobilized in support of regenerative actions.