

The Root Causes We Ignore

The four basic causes of today's planetary crises that this article focuses on are rarely addressed by most environmental professionals, who rely on the myth that technological innovation will allow endless growth on a finite planet



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READERS should be well-aware that we are facing interconnected planetary crises that are eroding the Earth's life support systems. Human actions—mostly by people in the Global North—are causing multiple crises, such as rapid loss in biodiversity, the filling of oceans with plastics, the conversion of forests into monocultures for agriculture, air and water pollution, climate change, and injustice.

Despite knowing about these crises for decades, we have let them get worse. From an evolutionary standpoint, humans are an extraordinary species, with incredible capacities for intergenerational learning and community cooperation. These capacities have enabled us to create amazing technologies, including altering the Earth to support about 7.9 billion people. We have become the dominant species on the planet, and the survival or extinction of other species depends on our actions. Yet we are on the brink of destroying the planet's life support systems that we depend on. Why?

My answer is we are not making progress because we ignore the root causes, and thus our "solutions" are not effective. Instead, we uncritically hope that technological innovations will completely offset endlessly increasing consumption and population growth on a finite planet, despite growing evidence to the contrary. I used to believe in this myth myself. In 1986, I began my career at EPA as an enforcement attorney to compel companies and municipalities to install required pollution control treatment. If we could get everyone to use the required treatment technology, we would go a long way toward solving our environmental problems. I soon realized that pollution discharge standards would need to become stricter over time in response to continuing population and economic growth. Even if it were technologically feasible to continuously tighten discharge standards, implementing tighter standards would face huge legal, practical, and political hurdles.

I now see four root causes of our environmental crises, causes that are increasingly the focus of academic literature but rarely discussed in this journal.

The **first root cause** is that we have created a world that may no longer align with our evolutionary strengths. For more than 99 percent of our 200,000 to 300,000 years as a species, our abilities were well aligned to perceive, understand, and react to the dangers we faced in that world—dangers that were immediate and local.

We evolved in a world in which the dangers that threatened our survival were immediate, easy to perceive with our own senses, and impacted just our local community. In contrast, most of today's greatest dangers develop over decades, require special monitoring and

analysis to understand, and impact not just our local community or region but the whole planet.

Our ancestors did not have to gather and analyze large data sets using scientific theories to understand that the pesticide DDT, lead in gasoline, or burning coal were long-term threats to the ecosystem. Further, our ancestors did not need to understand that the short-term and local benefits from cutting down forests to grow avocados or raise cattle to sell to people in distant lands would generate long-term disasters for the planet and its biodiversity.

Humans are an ultrasocial species. Cooperating within our community in which we are surrounded by our relatives is baked in by our evolutionary biology. Today's planetary problems mean cooperation must extend to billions of other persons who we will never see or know. This task is not cooperation, but pure altruism. Scientists have pondered whether pure altruism in humans exists: that is, do we make individual sacrifices for the greater good without any expectation that it will benefit us or our close relatives? This question has yet to be definitively answered. Thus, intergenerational cooperation across almost 200 nations and billions of people may be our greatest challenge.

Try to visualize the materials, energy, and land consumed by 7.9 billion people and the waste they produce. Imagine the largest football stadium in the United States at the University of Michigan, packed with 107,000 fans. The world's population would fill 73,419 of those stadiums. Imagine how many hot dogs they would consume, and toilet flushes they would generate. This is the **second root cause** of our environmental problems: the huge number of humans today, which only continues to increase. Back in 1969, when we first landed humans on the Moon, our population was 3.6 billion and growing fast. While the annual world population growth rate has decreased from about 2 percent in the 1960s to about 1 percent today, we continue to add about 80 million persons to the planet each year—akin to adding a new Germany each year. This is a huge impact that cannot be dismissed based on a declining population growth rate.

WITH 7.9 billion humans on a finite planet, the likelihood for conflicts among individuals and groups increases as a simple matter of density. The challenge in democracies of balancing individual liberty with the common good is much more difficult today because of our huge numbers. The late Supreme Court Justice Ruth Bad-

er Ginsberg stated in her dissent in the 2014 *Hobby Lobby Stores* case: “Your right to swing your arms ends just where the other man’s nose begins.” With 7.9 billion noses, we need to pay a lot more attention to our swinging arms than our ancestors did. For example, the difficulties posed by the Not In My Backyard (NIMBY) phenomenon in building green infrastructure (such as electric transmission lines to distribute renewable energy) should not be a surprise, given that there are more “backyards” in the country today than



ever before. Per U.S. Census bureau data, population density in the United States has increased from 29.9 persons per square mile in 1920 to an average density of 93.8 in 2020 (with, of course, huge variation among regions).

Many environmental professionals prefer to ignore human population as a cause of our environmental problems, either because of human rights concerns or the view that the problem is that the affluent countries are consuming more than their fair share of resources (which is true). Yet scientists have long recognized that population growth contributes to environmental

degradation, as expressed with the well-accepted IPAT equation from Paul Ehrlich, Anne Ehrlich, and John Holdren's 1977 book, *Ecoscience: Population, Resources, Environment*: ENVIRONMENTAL IMPACT = POPULATION X AFFLUENCE X TECHNOLOGY.

Most environmental professionals, businesses, and governments ignore two of the variables in this equation, population and affluence, and instead hope technological innovation will save us.

Population is often ignored because of a disturbing history of coercive approaches based on patriarchal, racist, and colonial oppression. Regarding these compelling ethical concerns, Colorado State University ethics professor Philip Cafaro reminds us that there are humane ways to address population growth that do not rely on forced sterilization or single-child policies. Since 2016, scholars have published six books defending the ethical imperative to address population growth. Robin Maynard, director of the organization Population Matters, believes there is a "population denial syndrome" that hinders rational public discussion of population's role in our planetary crises. Similarly, Haydn Washington, Ian Lowe, and Helen Kopnina explain this denial problem in their 2020 *Journal of Future Studies* article, aptly titled, "Why Do Society and Academia Ignore the Scientists' Warning to Humanity on Population?"

One of the best and often overlooked ways to reduce environmental damage is to address human population. Project Drawdown, the global research effort to identify the 100 most effective solutions available today to address climate change, ranks universal education for women and equal rights, which often leads to woman voluntarily reducing their family size, as the second most effective way to reduce GHG emissions. They estimate the total carbon reduction impact between 2020 and 2050 of increasing education and economic equality for women and providing full access to contraception as greater than distributed and utility-scale photovoltaics combined.

I AM a huge advocate for converting from fossil fuels to renewable energy, but we are fooling ourselves to believe that energy technology changes alone will address the huge environmental impact from almost 8 billion people consuming the planet's resources today while we continue to increase by about 80 million persons a year. And renewable energy is not magic: there are huge environmental impacts from the mining and production of wind turbines, solar panels, and storage batteries. There is little recognition about the need to use a circular economy approach in the transition to renewable energy.

As humans expand our consumption of energy, re-

sources, and land, other species are disappearing. For example, there are only 415,000 African elephants alive today, radically less than the 10 million alive in 1930. The biomass of humans and our livestock makes up more than 96 percent of the biomass of all land animals. Just 10,000 years ago, human biomass was barely noticeable. Perhaps you are not concerned that humans have become the dominant species on the planet and that our actions are causing the sixth mass extinction, the only mass extinction caused by one species. This lack of concern for other species has a name, anthropocentrism, which is the **third root cause**. Our culture increasingly views the Earth and all creatures as resources for human use. We view ourselves as the superior species, with other species having no moral right to exist unless they are of measurable economic value to humans.

Scholar and author Eileen Crist sees anthropocentrism as the deeper cause of our ecological crises. In her 2018 *Science* essay, she explains that this worldview: "forms the tacit postulate from which people source meaning and justification . . . Human supremacy is the underlying big story that normalizes the trends of more, and the consequent displacements and exterminations of nonhumans—as well as of humans who oppose that worldview."

Consider a new shopping center or factory built on open land. Most of the insects, animals, and birds that used to live on this land probably died because of the destruction of their habitat. As J.B. Mackinnon explains in his 2021 book *The Day the World Stops Shopping*, these creatures did not simply pack their bags and move to another home. Unless these creatures were protected by the federal Endangered Species Act, this destruction is viewed as part of human progress. Simply by questioning the need for expanding the built environment, I am violating the anthropocentric worldview, and many persons may dismiss me as a luddite.

Returning to the IPAT equation, we know P, the human population factor, is a cause of global environmental problems, yet we prefer to ignore it when we are looking for solutions. That leaves us with T, technology, and A, affluence, as the levers to pull for addressing our ecological crises. Endless economic growth (affluence) is part of the anthropocentric worldview and so we rarely question the need for increasing affluence. This leads me to the **fourth root cause** of our environmental problems: our belief that technological innovation will allow us to continue endless economic growth on a finite planet based on our current extract-make-pollute-consume-trash economic culture.

A 2020 meta-analysis by Tere Vaden and five other researchers examined 179 articles to look for evidence where economic growth occurs without concomitant

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Anthropocentrism Is a Key Root Cause

THE hallmark of our reign on Earth might be that we caused the sixth mass extinction and the collapse of the planet's climate system. It's true that we have not been able to make much progress on the environmental front because we are ignoring root causes. But, why are we ignoring these? And, what will it take for us to start paying attention?

We ignore these root causes because we humans believe we are the most mentally superior and moral species that ever existed, and whether other species live or die is our decision. This, in turn, shapes our attitudes toward human birth and life, the evaluation of "our morality" as superior (instead of limited), and our relentless belief that our progress can be infinite.

Believing that human beings are superior morally and mentally compared to other beings comprises a set of norms, attitudes, and constructed beliefs called *anthropocentrism*. It parades around as a set of facts, baked into our politics, our economy, and our handling of the environmental crisis, yet it goes almost completely unnoticed for what it is: an arbitrary intergroup hierarchy imposed by the most powerful species through cruel, systematic, extensive, and violent domination. If the causes and consequences of anthropocentrism continue to go unnoticed, the root causes will remain untackled.

If anthropocentrism inoculates us from the stress of grappling with uncomfortable truths, then our relationship with animals provides a way through. Dismantling this system of domination can start with *who*, as opposed to *what*, is on our plates. Three times a day, by choosing to go plant-based those of us who are privileged and



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fortunate enough to have dietary options (we also tend to have the largest environmental footprints, so it is a win-win) can engage in daily acts of revolution against this dangerous, yet invisible status quo belief in human moral and mental superiority.

Mark it for what it is: a political act of rebellion, for those who are brave, relating to so much that is wrong, including concentrated, powerful interests, sexism, racism, and post-colonialism (look up systems thinkers like Marion Nestle, Michele Simon, Aph Ko, Breeze Harper, Christopher Sebastian, Carole Adams, and Nivi Jaswal).

There are also tremendous environmental and health benefits from reducing consumption of animals and animal products, benefits that are often overlooked, but are gaining attention. Environmentally, if we expand our lens and consider the three other planetary boundaries we have exceeded in addition to climate change—land-system change, the nitrogen and phosphorus cycles, and biodiversity—we can properly understand how animal agriculture is at the heart of our problems. Recent research tells us it is the leading cause or a driver of humans exceeding four of the nine planetary boundaries.

One unique set of statistics gives real insight: animal agriculture uses 83 percent of all available farmland on the entire planet, contributing 56 to 58 percent of food's different emissions, yet it produces just 18 percent of our calories and 37 percent of our protein. These numbers are according to the most comprehensive analysis of agriculture to date, published in 2018 by Poore and Nemecek in *Science*.

Eating animals and animal products the way that western people do and have imposed on others has increased cancer, diabetes, heart disease, and more. For communicable diseases, most experts will not be surprised if the next big viral pandemic is traced directly to a factory farm.

We could start to dismantle anthropocentrism by not putting another being on the plate—which can also greatly contribute to moving us away from the brink of collapse. Once we dismantle anthropocentrism, we might be capable of complex, public conversations around life, why our taken-for-granted moral systems could use some work, and how we can liberate ourselves from a politically, economically, and socially legitimized system built on myth.

growth in resource use and negative environmental impacts. This concept, referred to as absolute decoupling, is when there is an increase in economic growth, usually measured by GDP, but no increase (or even a decrease) in global material extraction, energy use, and pollution. Vaden's review of the existing empirical evidence for absolute decoupling finds no support for this concept happening in practice. A separate 2020 review by Thomas Wiedmann and three other scientists finds that the overwhelming evidence indicates that "globally, burgeoning consumption has diminished or cancelled out any gains brought about by technological change aimed at reducing environmental impact."

The evidence against decoupling (sometimes called green growth) is not new. In 1865, the English economist William Stanley Jevons observed that technological improvements that increased the efficiency of coal use led to the increased consumption of coal in a wide range of industries. He explained that technological progress could not be relied upon to reduce fuel consumption, as once more efficient technology is introduced, the resulting increased demand more than offsets any efficiency gains. The Jevons Paradox is also called the Kazoo-Brooks postulate, rebound, or backfire (although there are some distinctions among them).

Technology has created greater efficiency in material and energy use for many products, such as computers. But the explosion in the growth and use of computers means that resource consumption continues to increase despite the huge efficiency improvements. Christopher Magee and Tesselano Devezas in a 2017 study reviewed 57 cases of material use for chemical, computer, and energy technology over 20 years and found no cases in which a technological improvement led to global dematerialization. Technological improvements on a per-unit base have reduced resource use and pollution, such as catalytic converters to reduce tailpipe air pollution per mile driven. And the amount of material to make a transistor has decreased significantly, such that silicon use has only gone up 345 percent between 1968 and 2005, while the number of transistors produced has increased much more. Magee and Devezas, consistent with the larger meta-analysis by Vaden, conclude that additional research is expected "to support the major empirical finding reported here—that direct dematerialization due to technological progress will not occur."

One theoretical way to decouple economic growth from increasing consumption of energy, resources, and pollution generation would be to create a fully circu-

lar economy. Since resource extraction and disposal of products remain as economic externalities, and selling more new products drives GDP and corporate profits much more than the four Rs (repair, re-use, repurpose, and recycle), we see little progress on the circular economy. If we were willing to change our economic system to fully internalize the externalities, such as assessing a non-trivial fee on the use of raw materials in manufacturing products and creating extended producer responsibility, then technological innovation might lead to some decoupling and dematerialization. I doubt that voluntary efforts to create a circular economy will work, and may lead to greenwashing, such as the plastics industry promoting their containers as recyclable when the vast majority are not recycled. Lest you dismiss my view as reflecting the bias of a former government regulator, a former senior executive in the clothing industry in 2022 published an article, "The Myth of Sustainable Clothing," in the *Harvard Business Review* acknowledging that 25 years of voluntary sustainability efforts in the fashion industry failed to advance sustainability. Instead, the former executive argues government regulation is needed, such as fees on the use of raw materials and replacing GDP with better measures of progress.

PROMINENT economists have pointed out the serious limitations of GDP as a measure of human progress. For example, if I were to successfully persuade my neighbors to not buy a new second automobile and instead buy a bicycle for local commuting, the result would reduce GDP but lead to improved health from more exercise and less air pollution, benefits ignored by this dominant measure. Alternative measures to supplement or replace GDP have been developed, such as the Genuine Progress Indicator and the UN's Human Development Index, but little progress has been made on adopting them, as they are inconsistent with the dominant economic ideology. As Robert F. Kennedy stated in 1968 at a campaign speech at the University of Kansas, we continue to measure human progress with a knowingly flawed GDP measure, which counts jails, napalms, and locks for our doors, but does not count our wisdom, courage, health, or happiness.

While mainstream economists prefer to ignore limits to growth and continue to worship at the church of technology and managerial efficiency, ecological economists recognize that continuous economic growth on a finite planet is not possible without huge negative impacts. For example, see books by Jason Hickel (*Less is More*, 2020), Tim Jackson (*Prosperity Without Growth*, 2017), and Kate Raworth (*Donut Economics*,

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2017). And courageous economists raised these concerns decades earlier; see Herman Daly's 1977 book *Steady State Economics* and the Club of Rome's 1972 report *The Limits to Growth*.

The focus on "more is better" is so ingrained in our culture and economy that when growth creates a big problem, the incentive is to not fix the causes of the problem but to create new industries to address the symptoms. Thus, overconsumption has created new businesses to save us from drowning in things we do not need. Consider that in the United States, in my lifetime, the economy has created new businesses to store the things we own but do not really need in about 50,000 storage facilities. These buildings have their own environmental impacts from consuming energy, materials, and land. You can now buy professional services to organize and declutter the things in our homes. There are businesses to sell us containers and shelves and build storage systems in our garages, basements, closets, and attics. And of course, we can pay others to haul away and trash the things that we finally realize we do not need.

These businesses contribute to GDP, and as consumption increases, they will grow—and we will celebrate our growing economy. Meanwhile, our problems get worse as we extract more resources and use more energy and land to produce, transport, package, advertise, sell, organize, store, and dispose of these items that we do not really need. And unlike air and water point source pollution, traditional economic analysis does not recognize excessive consumption as an externality.

Companies may claim they are becoming sustainable by reducing packaging, but their goal is still to sell us more new things. For example, Amazon, like most companies, advertises that consumption of their products leads to happiness, and they even put this message on the side of their delivery trucks. Yet behavioral science shows that once we reach a minimal level of material comfort, more consumption does not increase happiness.

DESPITE advances in technology, more people increases global consumption of materials, energy, and land, which generates more pollution—and the wealthy are disproportionately responsible for these negative impacts. For example, in 2020, Oxfam estimated that the richest 1 percent and 10 percent of humanity accounted for over 15 percent and 50 percent, respectively, of GHG emissions.

The four root causes I focus on here are not the only causes of our environmental problems. But they could be the key causes that are rarely addressed by most environmental professionals, who continue to

believe in the myth that technological innovation will allow endless growth on a finite planet.

This myth may be especially difficult to break because our evolutionary strengths lead us to focus on the short-term costs and benefits within our local communities. The need for more international cooperation to address planetary environmental problems is well recognized, but I worry that this amounts to believing in planetary altruism, which is not an evolutionary strength of our species. We need to create cultures that foster altruism across generations and distant lands.

Some may argue that altruism is the wrong concept and instead say we need international justice and compensation for the less affluent nations, since affluent nations primarily caused our global environmental crises and are continuing to cause more damage with their resource-intensive lifestyles. Yet affluent countries show little indication that they are willing to reduce their consumption of energy, materials, and land, and instead rely on the myth that technological innovation will save us. Less developed countries see the problem differently as they rightfully need to increase their consumption to pull their citizens out of poverty. Resolution of this conflict requires humans to go beyond our evolutionary strengths and figure out how we can address this huge root cause.

The profession should actively engage in discussing these root causes of our planetary environmental crises. Doing so may make some people uncomfortable, as they challenge dominant ideologies. Solutions will require us to figure out how we can live a life today that recognizes the needs of future generations, people living in other countries, and millions of species that we are poised to extinguish. Incremental changes via technological innovation are part of the path forward, but we need big, systematic changes to create solutions. I have briefly touched upon some potential solutions, such as huge investments to advance educational and economic opportunity for women and restructuring our economic pricing to create a circular economy. These solutions are hard because they require behavioral change and challenge the prevailing power structures and our anthropocentric worldview.

If environmental professionals do not lead by addressing these root causes, we risk becoming irrelevant—or worse, part of the problem. The profession should advance a robust dialogue on how to address these root causes. That is our responsibility and opportunity. **TEF**

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