

## **A Call to Look Past *An Ecomodernist Manifesto*: A Degrowth Critique**

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One of the counties within the province of sustainable development is now called “ecomodernism,” and it has come to prominence over the past few years, in part because of the figures associated with it, including prominent environmental thinkers such as Ted Nordhaus, Michael Shellenberger, and Stewart Brand. The *New York Times* recently praised the ecomodernist message in an article called, misleadingly, “A Call to Look Past Sustainable Development.”<sup>i</sup> Why is the article’s title so misleading? For the simple reason that the figures within ecomodernism want cultural and economic change that is sustainable, just like the rest of us; they simply want to move the focus of development in a new direction, even though this “new” direction seems surprisingly and troublingly conventional at times. The *New York Times* article mentions a new statement of principles that the ecomodernists published this year. It is called *An Ecomodernist Manifesto* (2015) and is co-authored by eighteen leading lights of the sustainability movement, including Nordhaus, Shellenberger, and Brand, but also the physicist David Keith, the scientist, Nobel Prize Winner, and Indian economist Joyashree Roy, and the filmmaker Robert Stone. Many of the authors are associated with The Breakthrough Institute, a think tank whose mission has been described as “‘neoliberal conservation’ guided by economic rationality and human-centered managerialism.”<sup>ii</sup>

Given the level of attention that ecomodernism has received, it seems worthwhile to analyze critically the ecomodernists’ manifesto, and to offer those criticisms from a county on the other side of the province—namely, from the point of view of “degrowth.”<sup>iii</sup> Degrowth has also risen to prominence in recent years, ever since the Great Recession (2008-2009) forced a reappraisal of the growth-addicted, deregulated, neo-liberal economic policies that have dominated national governments and international financial institutions since the 1980s.<sup>iv</sup> Indeed,

degrowth has also had its moment in the sun—that is, in the *New York Times*—as it has been the subject of a heated public debate between the economist Paul Krugman and ecological economists. Krugman’s article, “Errors and Emissions” (18 September 2014) triggered an impassioned exchange between Krugman, Richard Heinberg, and others involved in degrowth and the economics of sustainability.<sup>v</sup> It would appear that the debate over growth is back in fashion for the first time since the 1970s.<sup>vi</sup>

Sustainable degrowth has been defined by numerous authors over the past five years, but François Schneider, Joan Martinez-Alier, and Georgios Kallis offer perhaps the simplest and clearest definition: “Sustainable degrowth is defined as an equitable downscaling of production and consumption that increases human well-being and enhances ecological conditions.”<sup>vii</sup> Those who populate the degrowth county are equally interested in sustainable development (or developing towards sustainability), but diverge from ecomodernism and the denizens of other counties in some crucial ways. While ecomodernists, as we shall see, tend to promote the necessity of endless economic growth and the role that new technologies will play in creating a sustainable global society, the backers of degrowth see the transition to sustainability (or a steady-state economy) occurring through less impactful economic activities and a voluntary contraction of material throughput of the economy—at least, in the more developed and wealthier parts of the globe<sup>viii</sup>— to reduce humanity’s aggregate demands on the biosphere. From a degrowth perspective, technology is not viewed as a magical savior since many technologies often accelerate environmental decline.<sup>ix</sup>

After careful analysis, those in the degrowth camp have come to the conclusion that the only way for humanity to live within its biophysical limits and mitigate the effects of climate change is to *reduce* economic activity, to downscale consumerist lifestyles, to move beyond conventional energy sources, to give up on the fantasy of “decoupling” economic and population growth from environmental impacts, and to rethink the technologies that have gotten us into our current predicament. There has been no known society that has simultaneously expanded economic activity and reduced absolute energy consumption.<sup>x</sup> All efforts to

decouple growth of gross domestic product (GDP) from environmental destruction through technological innovations and renewable energies have failed to achieve the absolute reductions necessary for a livable planet. There has only been a handful of instances over the past century during which global or regional carbon dioxide (CO<sup>2</sup>) emissions have actually declined. Notable instances include: 1) the Great Depression of the 1930s, 2) the economic recession following the second oil shock in the early 1980s, 3) the collapse of Soviet economies after the end of the Cold War, and 4) the two years of recession following the financial crisis triggered in 2008. That is, from all that we know, only a less “busy” economy can actually achieve lower emissions.<sup>xi</sup> Likewise, the ecological economist Peter A. Victor has shown through modeling the Canadian economy that economic growth makes the job of fighting climate change all the more difficult. He writes that “for example, if an economy grows at 3% per year for 40 years, an average annual reduction in GHG [greenhouse gas] intensity of 7.23% is required if GHG emissions are to be reduced by 80%. This compares with an average annual reduction in GHG intensity of 4.11% if there is no economic growth during that period.”<sup>xii</sup>

The following is a critique of the *Ecomodernist Manifesto* from the point of view of degrowth, which draws on a biophysical and ecological perspective, as well as the science of thermodynamics, and rejects the idea that industrial modernity provides a simple blueprint to a future, sustainable society. It is written, however, with the recognition that at least *some* of the claims in the *Manifesto* are accurate and worth supporting. Indeed, there is much to admire in it, including the optimistic tone of its authors and the genuine affinity for the natural world that leaps off the page. Further, it must be acknowledged that the different countries within sustainable development want fundamentally the same thing, which is a world that respects ecological realities; enhances public health, human wellbeing, equity, justice, democracy, and life satisfaction; and creates the conditions for resilient ecosystems and a stable and prosperous global civilization. Debate among different schools of thought is healthy and ultimately beneficial for the broader sustainability movement.

In some ways, the disagreements between ecomodernists and degrowthists revive long-standing disagreements among sustainable development proponents about the twin role played by economic growth and modern technological innovation in ameliorating humanity's conditions—disagreements that have existed ever since the United Nations began to endorse sustainability in the 1980s.<sup>xiii</sup> Should development occur in a top-down fashion, brokered by powerful international nongovernmental organizations (NGOs), governments, and industry, or bottom-up, in organic, low-impact, and community-led efforts? Does one create a sustainable society via deregulated financial institutions and growth-based economics, or through regulated economic systems and the abandonment of pro-growth policies? These questions have elicited wildly different answers. Indeed, the two flagship documents of sustainable development, the *World Conservation Strategy* (1980) and the more well-known *Our Common Future* (the Brundtland Report, 1987), while helping tremendously to provide the concept of sustainable development with an identity, contain, in certain places, contradictory or at least inconsistent ideas about the role that technology and economic growth should play in future development.<sup>xiv</sup>

Not only does the *Manifesto* rehash the belief that yet more growth and yet more technology will save us, but it also suffers from a range of other problems, including factually incorrect statements, deficient and contradictory argumentation, dubious environmental claims, and shocking omissions. The purpose of this short essay is to deconstruct the statements, arguments, and vision of the ecomodernists' manifesto, while offering, where appropriate, counterclaims and counterarguments that can hopefully better illuminate the challenges of sustainable development moving forward.

The manifesto, which does not include sources or references, is divided into seven sections (*The Communist Manifesto*, by contrast, had only four) that puts forth a vision of a future society, or a pathway to that society, that is driven by the creation of new technologies, as well as the “intensification” of human activities, that together would “decouple[e] human development from environmental impacts (7).<sup>xv</sup> In short, the manifesto rehashes the fantastical goal, long pursued by neoclassical economists, of separating out the apparently desirable stuff (more

people, more affluence, more consumption) from the undesirable stuff (waste, pollution, environmental degradation, and declines in energy stocks). Key to the ecomodernist argument is the narrative of modernity, or in more technocratic language, “modernization.” The ecomodernists do not romanticize low-impact indigenous or pre-industrial societies, and do not seem to value anything about global societies that existed before, say, 1750, or those in the present that retain non-industrial practices. These people are simply and backwardly “undeveloped.”<sup>xvi</sup> The ecomodernists view the Industrial Revolution as a largely positive phase of human history that increased life expectancy, allowed for technologies that increased human wellbeing, produced modern medicine and the ability to more effectively fight disease, and created systems that mitigated the effects of natural disasters (8).

At times, the manifesto reads like a chapter from a Herbert Spencer tract; the love, admiration, and faith in science and technology borders on the Victorian, and the mythos of Progress, so essential to industrialism since the 19<sup>th</sup> century, is bizarrely juxtaposed against more sober acknowledgements of humankind’s toll on the planet. Here’s one example of this rather saccharine metanarrative of Progress: “Personal, economic, and political liberties have spread worldwide and are today largely accepted as universal values. Modernization liberates women from traditional gender roles, increasing their control of their fertility. Historically large numbers of humans—both in percentage and in absolute terms—are free from insecurity, penury, and servitude” (8-9).

One does not need a degrowth perspective to understand that this statement is highly questionable and that the effects of “modernization” have been more complex than this liberationist narrative would suggest. The “liberation” of women from “traditional gender roles” was due in large part to the work of twentieth-century suffragettes and feminists, and had relatively little to do with industrialism in the narrow sense. (And what about women in the non-Western industrialized world?) It is important to acknowledge, moreover, that child labor and 16-hour days for adults fuelled the Industrial Revolution and were ended only by strike action taken by trade unions in the face of strong opposition by industrialists. In these

cases, technology and industrial production were the problem, for which collective, grass-roots action and resistance was the solution. Further, the idea that there are fewer people in “servitude” in 2015 than there were in the past is also a debatable point. New research sponsored by the United Nations suggests that over 20 million people are currently working as modern-day slaves.<sup>xvii</sup> The *total* number of African slaves brought to the Americas by Europeans between 1500 and 1850 was 12 million, although many millions more died in waiting or in transit.<sup>xviii</sup> At no single point, however, did the population of African (or aboriginal) slaves come close to 20 million. Slaves and subjugation certainly existed in other parts of the world, too, but the notion that servitude has declined in real numbers over time ultimately rests on the subjective interpretation on the word “servitude.” But the raw numbers are, here, beside the point. The point is that ecomodernism offers a peculiarly whitewashed and sugary interpretation of industrial modernism, and fails to acknowledge that the interrelated problems of overconsumption and environmental decline were *not* coincidental byproducts of those modern industrial processes. Industrial modernity has certainly brought numerous benefits to humankind, but it has come at a heavy toll, and one that jeopardizes the possibility of creating a sustainable society.<sup>xix</sup>

The technology-will-save-us thesis of the ecomodernists merely restates the optimism of industrialists and many futurists going back two centuries or more, but also borrows from the technocratic school of thought within sustainability that is often associated with Amory Lovins.<sup>xx</sup> The ecomodernists paper over the highly destructive nature of modern technologies throughout the manifesto, or else exaggerate the benefits of emergent technologies, such as the dubious and largely untested systems for carbon capture and storage (24). “Given that humans are completely dependent on the living biosphere, how is it possible that people are doing so much damage to natural systems without doing more harm to themselves?”(9). It comes as news to us that humans are not doing harm to themselves. The World Health Organization reported recently that in 2012 around 7 million people died—that is, one in eight of total global deaths—“as a result of air pollution exposure,” the vast majority of which was emitted via “modern”

technologies.<sup>xxi</sup> In the 1970s, Paul Ehrlich developed the metric  $I = PAT$ , in which the overall impact of a society is determined by the factors of population, affluence, and technology.<sup>xxii</sup> This metric was invented as a caution toward overly simplistic acceptance of technologies, but the ecomodernists set aside this concern (28) and assume that more technology is necessarily the solution. The *Manifesto* is silent on the topic of geoengineering, but one worries that the ecomodernists support this fraught and highly risky response to climate change.<sup>xxiii</sup>

The ecomodernists scoff at the idea of “limits to growth,” arguing that technology will always find a way to overcome those limits. “Despite frequent assertions starting in the 1970s of fundamental ‘limits to growth,’ there is still remarkably little evidence that human populations and economic expansion will outstrip the capacity to grow food or procure critical material resources in the foreseeable future” (9).<sup>xxiv</sup> Here is one of the first clues that the ecomodernists agree with George H. W. Bush that the limits to growth are, in the words of the former president, “contrary to human nature.”<sup>xxv</sup> But what additional evidence do the ecomodernists need to appreciate that the limits to growth *are* being reached?

Graham Turner, Ugo Bardi, and numerous others have shown through empirical research that many of the modeled scenarios, and the fundamental thesis, of the Club of Rome remain as relevant as ever—that is, that the human endeavor is bumping up against natural limits.<sup>xxvi</sup> Richard Heinberg has demonstrated that the production of conventional oil, natural gas, and heavy oil all peaked around 2010, despite, but also due to, continued global reliance on fossil fuels, which still comprise over 80% of the world’s primary source of energy.<sup>xxvii</sup> The so-called Green Revolution and chemically intensive conventional farming has polluted many of the world’s waterways and lakes, and has caused a New Jersey-sized dead zone in the Gulf of Mexico. In North America, the vast majority of the original humus content on arable land has been lost to agriculture and monocultures.<sup>xxviii</sup> There are 7 million tons of accumulated non-biodegradable plastic debris caught in the eastern and western gyres of the Pacific Ocean, and half of the fish biomass in the world’s oceans show traces of microplastic contamination.<sup>xxix</sup> Copper will be in short supply by as early as the 2030s, and a number of rare Earth minerals will not be far behind.<sup>xxx</sup>

Perhaps the absolute limits to growth have not yet been reached, but mounting evidence suggests that they are not far off, and it behooves ecomodernists to consider that yet more growth might *not* be the answer. The history of industrialism to date suggests that more growth will be coupled with increasing environmental costs.<sup>xxxix</sup> It is also worth realizing that many once-thriving societies, from the Anasazi to the Maya, collapsed due to demographic, ecological, and social pressures.<sup>xxxix</sup> The limits to growth are real, even if their exact nature differs over time and space.

Moreover, the ecomodernists' disregard for ecology and natural systems is disturbingly anthropocentric. That is, they ignore or externalize the non-human casualties of growth. Even if technology and human ingenuity enabled miraculously the endless growth of "human populations and economic expansion"—why would we want this, again?—this Biggering would still generate manifold environmental impacts. The collapse of the Atlantic northwest cod fishery in the 1980s and early 1990s is merely one example of ecological ruin that was facilitated by industrial technologies (refrigeration, new kinds of ships, new harvesting materiel, and so forth) and the naïve contempt for natural limits.<sup>xxxix</sup> When the Canadian Federal Minister of Fisheries and Oceans declared a much-belated moratorium on the cod fishery in 1992, it brought to an end 500 years of intensive cod harvesting, destroyed many Canadian maritime communities, and put paid to the debate on natural limits. It is true that humanity survived the decline of the Northern cod, but does the precipitous decline of this fishery matter in the Story of Modern Progress?

One of the central arguments of the *Manifesto* is that human-induced environmental impacts could one day become "decoupled" from economic growth. As noted, this has long been the fantasy of neoclassical economists, who want to have their cake and eat it, too.<sup>xxxix</sup> But rather than addressing the fundamental flaws of a growth-obsessed economy, the ecomodernists assume that economic growth is both necessary and possible in the long term and that, therefore, technology will have to do the work of decoupling. "Decoupling of human welfare from environmental impacts will require a sustained commitment to technological progress and the continuing evolution of social, economic, and political institutions

alongside those changes” (29). The authors argue that the *relative* environmental impact of humans has decreased in some domains, even though there has not been an absolute decoupling of these aggregated impacts (11). They cite as evidence the fact that many countries have reduced their carbon intensity over the past few decades, meaning that they get more economic bang for their energy buck (20), partly because of increases in energy efficiency. However, to hold aggregate ecological impact over time constant with growth, eco-efficiency would need to improve at the same rate as the economy grows, which places a heavy burden on engineers and inventors. More troublingly, the ecomodernists fail to address the deeper problem that absolute, aggregated impacts have continued to climb—the concentration of GHGs in the atmosphere is increasing, the extinction of species chugs along at an alarming rate, the Human Appropriation of Net Primary Production (HANPP) remains staggeringly high, and the world’s major ecosystems have only become more degraded since the middle of the last century.<sup>xxxv</sup> Moreover, there is no hint of the Jevons Paradox—the long-recognized enigma that increases in technological and energy efficiency almost always *increase* consumption, not decrease it, due to various rebound effects.<sup>xxxvi</sup> But the more profound dilemma is that ecomodernism is still locked inside the business-as-usual, growth paradigm.<sup>xxxvii</sup> It is certainly true that a growing global economy will mean greater impacts on the natural world and human health, which is why we question the necessity of this growth.

Even the most anti-growth and pro-steady-state economists, from Herman Daly to Daniel O’Neil, argue that some parts of the world, namely Sub-Saharan Africa, could benefit from more economic growth.<sup>xxxviii</sup> Many other parts of the planet would benefit from less growth, or in any case, will have to make do with a less busy economy. The point is that there needs to be a more critical and qualitative approach to growth, and one that jettisons GDP as a meaningful measure of economic well-being. But the ecomodernists seem to assume that all growth is good, in contradistinction to the degrowthists, who recognize that much of the growth in the developed world, with its high levels of material throughput and energy consumption, is “uneconomic” and leads to long-term costs and environmental

impacts. In other words, growth backfires. Rather than leaving the developing world to play an impossible game of catch-up with levels of energy and material consumption in the developed world, what is needed is for the high-consumption countries to cease treating the present growth model as a limitless aspiration for others to follow.<sup>xxxix</sup>

One of the most unfortunate results of this technophilism and Biggering-Is-Better attitude is the ecomodernists' adoration of nuclear power. The environmental thinkers behind the Manifesto seem to have followed James Lovelock into the misguided belief that nuclear power is the only hope for humanity.<sup>xl</sup> Some passages rival H. G. Wells' *Anticipations* (1901) in their gushing optimism in Scientific Progress. Consider the following:

“Human civilization can flourish for centuries and millennia on energy delivered from a closed uranium or thorium fuel cycle, or from hydrogen-deuterium fusion” (10).

“Nuclear fission presents the only present-day zero-carbon technology with the demonstrated ability to meet most, if not all, of the energy demands of a modern economy.” (23)

“We think it is counterproductive for nations like Germany and Japan, and states like California, to shutter nuclear power plants, recarbonize their energy sectors, and recouple their economies to fossil fuels and biomass.” (28)

The reality is that nuclear power has never played a major role in meeting the world's energy demands, despite the fact that it was touted throughout much of the middle and late twentieth century as a panacea for our energy woes. According to the Intergovernmental Panel on Climate Change (IPCC), nuclear provides only 2 percent of the world's energy, although the International Energy Association puts

the number at 5.7 percent.<sup>xli</sup> These numbers are still well below those of renewables, which are pushing 15 percent of global energy consumption.<sup>xlii</sup>

Indeed, there are at least eight reasons that nuclear power should not be seen as a positive contribution from the standpoint of sustainable development, and it is worth dwelling on them in detail, since ecomodernism places so much emphasis on nuclear. First, nuclear power has never lived up to its expectations as a major energy source, especially when compared to its *immense* impacts and costs. Second, the building of nuclear power plants is hugely capital intensive, which seems to contradict the *Manifesto's* call for “cheap, clean, dense, and abundant” energy sources (24). Third, nuclear power is a nonrenewable resource since uranium is finite, and some energy analysts project that low-cost and accessible stocks could become quite scarce by 2080. Fourth, most countries do not possess uranium deposits, and therefore nuclear power prevents many countries from achieving energy independence. Fifth, most countries do not currently have (or want, or could even consider) a nuclear power plant. As of 2013, only 31 countries had this capacity. Sixth, nuclear power and nuclear weapons are inherently linked since the ability to produce nuclear power also establishes the material basis and expertise for making nuclear weapons. It is not an energy source that creates the conditions for long-term peace, as we have learned recently, once again, in the standoff between Iran and the West. Seventh, nuclear waste is dangerously radioactive and essentially impossible to store safely in the long term, since the waste takes thousands of years to lose its radioactivity. The 440 or so nuclear power plants that function today generate enormous amounts of waste, much of which is still sitting on the grounds of the power plants, while some has been stored in caves or dumped in the ocean. Eighth, and finally, nuclear power plants are prone to catastrophic disasters—that is, environmental impacts—such as the ones that occurred in 1986 at Chernobyl, and in 2011 at the Fukushima Daiichi plant in Japan.<sup>xliii</sup> Even with future breakthroughs in nuclear technology, the reality is that a nuclear power will always remain an ecologically reckless endeavor.

As a result of these disasters, and these concerns, public confidence in nuclear power has waned considerably in most countries around the world, and

some governments, such as in Germany, have begun phasing out their remaining facilities. As seen above, the ecomodernists do not like that citizens in Germany or Japan are questioning nuclear power. Yet this indignation is insensitive in the extreme. For starters, Japan is still coping with a major power plant calamity, and one that has led to much soul-searching over the future of energy in Japan. In Germany, the effects of the Chernobyl disaster were direct and impactful. In West Berlin, for instance, the prevalence of Down syndrome rose dramatically in the nine months following the incident, which blanketed much of Western Europe in radioactive fallout. It may very well be true, as the *Manifesto* notes, that nuclear power is a low-carbon technology (at least, in the direct production phases of the energy), but there are *many* other health and environmental impacts to consider, not to mention the political and economic ramifications of this technology. More nuclear power plants will almost inevitably mean more disasters and more long-term storage headaches. The ecomodernists seem particularly miffed that Germans want to “recarbonize” their economy, since reducing nuclear will, according to the *Manifesto*, require filling the void with coal (along with wind, biomass, and solar), although this, too, is a complicated matter. Renewable energy production has, so far, overcompensated for the decline in production in nuclear energy, and there is every indication that it could continue to do so. It is true that Germany, along with many other countries, is still powered in part by coal. But Germany, unlike national governments in Canada or the United States, has a long-term energy plan to wean itself from fossil fuels.<sup>xliv</sup> Why abandon those gains in favor of nuclear power (a proven liability) and carbon capture and storage (which reinforces the fossil-fueled status quo)?

Rather than ramping up on dangerous forms of energy production to meet increased economic activity, the world needs less (and also different) economic activity and a sustainable population, which could then create the possibility of powering the world via renewable resources. That is, degrowthists and ecomodernists agree that economic growth creates energy problems, but the two camps differ starkly in their response to this dilemma. For the ecomodernists, population and economic growth are taken as givens, and thus governments are

forced into making difficult decisions about energy, including support for conventional, hard energies, from coal and gas to nuclear power. For degrowthists, population growth and continued economic expansion are seen as undesirable and essentially impossible in the medium term, and thus the solution is to live within biophysical limits, and reduce global energy demands to a level that could be safely met by renewables. To borrow a book title from Ted Trainer, *Renewable Energy Cannot Sustain a Consumer Society*.<sup>xlv</sup>

The ecomodernists also assume that the increasing urbanization of the planet is fundamentally positive. Dehli now counts 25 million people. Beijing has over 21 million smog-choked inhabitants. Mexico City, 20 million. Cities now occupy an astounding three percent of the Earth's surface and house around four billion people (12), leading to historically unprecedented densities of human clusterings. While urban dwellers tend to have higher incomes and better access to societal services than their rural counterparts, looking only at the average number hides the deep inequalities within and across cities worldwide. A city such as Mumbai has stunning inequalities, human suffering, public health crises, slums, and dilapidated infrastructure. The relative affluence of urban dwellers comes at a cost for the environment. Cities are home to about half of the global population, but contribute about 80 percent of global GHG emissions.<sup>xlvi</sup> It is hard to see how yet more urbanization will necessarily increase human wellbeing, as the ecomodernists credulously contend. Economic growth has been accompanied by mounting income inequalities in urban areas and beyond. In contrast to the three decades of rapid growth following World War II, the little growth that has been squeezed out of the economic system in recent years has largely benefitted the richer strata of society, while cramming the world's poor into densely packed cities, from China to Brazil.<sup>xlvii</sup> The bright and powerful vision of economic growth—to provide the material basis for a better life for all—bears little resemblance to the current prospects of only accumulating the wealth of the richest while destroying the environment and livelihoods of future generations and the poorest and most vulnerable today.

Further, ecomodernism is patently condescending toward peasants, farmers, and those who support agrarian values. This *Manifesto* is not for Wendell Berry. The

authors note that only two percent of Americans are today engaged in farming, whereas half the population lived and worked on farms in the 1880s (12)—a demographic shift, it should be noted, that was facilitated by access to cheap and abundant fossil fuels. The authors go so far as to say that humans need to be “liberated” from agricultural labor, as though the production of food were not an essential good in and of itself. This very westernized and industrialized snobbery toward agrarianism is redolent of Nicholas Kristof and Sheryl WuDunn’s infamous and repugnant *New York Times* article, entitled “Two Cheers for Sweatshops,” which assumed that working in a wretched factory in industrial China was perforce a better fate than working in a rice paddy, as farmers in China have done for “forty centuries.”<sup>xlviii</sup> From the point of view of degrowth, a lower impact and less consumerist world will require an *increase* in farming (and gardening) and greater reconnections to the natural world. A sustainable global society will need more than two percent of the population engaged in food production. More generally, the *Manifesto* has literally nothing to say about the impacts of conventional farming, monoculture, pesticide-resistant insects, genetically modified organisms (GMOs), and the increasing privatization of seeds and genetic material. It implicitly implies that the Green Revolution was an unqualified positive for humankind. The CEOs of Monsanto and Nestlé would no doubt endorse this manifesto.

The issue of condescension toward indigenous cultures is particularly stark in the *Manifesto*. There is not a word about religion, spirituality, or indigenous ecological practices, even though the authors throw a bone to the “cultural preferences” for development (26). But the core assumption is that “development” has only one true trajectory, and that is to “modernize” along the lines of Western, industrialized countries. The conceit that technological modernity is Progress is hugely favorable to the development path of the Global North, but also quasi-imperialist in its assumption that the rest of the world needs to reproduce, in fast forward, the European and Neo-European Industrial Revolution. How is it simultaneously true that industrial modernity is both the problem and the solution? If the authors acknowledge, as they do, that industrialism has produced manifold negative impacts on the natural world, then why assume that yet more industrialism

will magically reverse this trend? Furthermore, the ecomodernists do not seem to believe that the “developed” North has anything to learn from the “less developed” Global South. Is it possible that indigenous societies that lived sustainably for long periods of time might have important lessons to teach the rest of the world? The ecomodernists do not seem to think so.

Finally, the *Manifesto* often uses misleading (if not downright false) language in making its case. The passages on deforestation are especially greenwashed. For instance, the ecomodernists claim that three quarters of deforestation occurred before the Industrial Revolution (16). This may be true, but as Williams (2002) has shown, this is not really saying much.<sup>xlix</sup> Anatomically modern homo sapiens have been around for 200,000 years, and it has taken only 250 years to produce one quarter of all recorded deforestation. This fact does not strike us as particularly laudable, nor is it laudable that pollutive fossil fuels replaced forest resources as the world’s primary form of energy. Also, on page 13, the *Manifesto* manages to imply that there is currently “net reforestation” occurring on the globe, but since the text has no sources, it is hard to know the origin or particulars of this claim. The 2014 *Millennium Development Report* shows that a combination of afforestation and reforestation efforts has slowed deforestation rates, but that the world still suffered a net loss of forested land between 2000 and 2010 by many millions of hectares.<sup>l</sup> Certainly, the vast majority of those who study deforestation, including the World Wide Fund for Nature and the United Nations, contend unequivocally that deforestation is an ongoing concern. “For example, in the Amazon around 17 percent of the forest has been lost in the last 50 years.”<sup>li</sup> The United Nations Food and Agriculture Organization’s 2005 *Forest Resources Assessment* paints a pretty bleak picture for the world’s tropical forests, and many of the temperate ones, too, noting that loss of woodland jeopardizes essential ecosystem services, a concept that never appears in the *Manifesto*.<sup>lii</sup>

The authors of *An Ecomodernist Manifesto* have their collective hearts in the right place. There is no argument that the human economy needs to “decarbonize” or that growth will create new energy challenges. There is no argument that “humans are

completely dependent on the living biosphere” and that ecosystems need to be protected and strengthened. We agree that climate change, ozone depletion, and the acidification of the ocean constitute real threats to the prospects of a sustainable future. Further, there is no argument that a sustainable society is one that would promote human wellbeing, public health, and life satisfaction. But unfortunately, the vision put forth by the ecomodernists, with its technophilia and support for endless economic growth, falls well short of crafting a set of objectives that can or should be adopted globally. There is nothing really “eco” about ecomodernism, since its base assumptions violate everything we know about ecosystems, energy, population, and natural resources. Fatally, the ecomodernists neglect to identify the ultimate ill that plagues us—to wit, the addiction to growth-based economics, rooted in finite and polluting fossil fuels, and the sprawling industrial society that these energy sources and policies have facilitated over the past two hundred and fifty years; deeper still, they subscribe to the pig-headed belief that all of this necessarily equates to a desirable mode of development. To be clear, there are alternative conceptions of development and modernity that do not perpetuate the destructive mindset and practices of economic growth, extractivism, exploitation, and technological dependency, but which open up pathways to a good life based on real sustainability, equality, justice, and ecological wisdom.<sup>liii</sup>

## Notes

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<sup>i</sup> Porter, E. (2015, April 14). A call to look past sustainable development. *New York Times*. Retrieved from [http://www.nytimes.com/2015/04/15/business/an-environmentalist-call-to-look-past-sustainable-development.html?\\_r=0](http://www.nytimes.com/2015/04/15/business/an-environmentalist-call-to-look-past-sustainable-development.html?_r=0)

<sup>ii</sup> Collard, R-C., Dempsey, J. Sundberg, J. (2014). A manifesto for abundant futures. *Annals of the Association of American Geographers*, DOI.

10.1080/00045608.2014.973007. See page 2. The authors of this manifesto for abundant futures anticipate some of the critiques offered here, including the neo-colonial orientation of ecomodernism.

<sup>iii</sup> Some of the responses to the manifesto have been published on the Ecomodernist’s own website: <http://www.ecomodernism.org/responses/>.

<sup>iv</sup> Harvey, D. (2007) *A brief history of neoliberalism*. New York: Oxford Univ. Press.

<sup>v</sup> Krugman, P. (2014, September 18). Errors and emissions. *New York Times*. Retrieved from <http://www.nytimes.com/2014/09/19/opinion/paul-krugman-could-fighting-global-warming-be-cheap-and-free.html>; Heinberg, R. (2014,

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September 22). Paul Krugman's Errors and Omissions. *Post Carbon Institute*. Retrieved from <http://www.postcarbon.org/paul-krugmans-errors-and-omissions/>; Also see Krugman, P. (2014, October 7). Slow steaming and the supposed limits to growth. *New York Times*. Retrieved from <http://krugman.blogs.nytimes.com/2014/10/07/slow-steaming-and-the-supposed-limits-to-growth/>; Also see Heinberg, R. (2014, October 10) Paul Krugman and the Limits of Hubris. *Post Carbon Institute*. Retrieved from <http://www.postcarbon.org/paul-krugman-and-the-limits-of-hubris/>.

vi Caradonna, J. (2014). *Sustainability: a history*. New York: Oxford Univ. Press, ch.4.

vii F. Schneider, J. Martinez-Alier, G. Kallis. (2011, October 5). "Sustainable Degrowth." *Journal of Industrial Ecology*. 15 (5), 654; The literature on degrowth has become voluminous. Many of the recent articles are inspired by the work of ecological economists over the past few decades, including seminal books by Herman Daly, William Rees, Peter A. Victor, Tim Jackson, and Richard Heinberg. For Heinberg and Daly, see footnotes below. Victor, Peter A. (2008). *Managing without growth. Slower by design, not disaster*. United Kingdom: Edward Elgar.; Jackson, Timothy. (2009). *Prosperity without growth*. United States: Earthscan.; D'Alisa, G., Demaria, F., and Kallis, G. Routledge.(Eds.). (2014). *Degrowth: a vocabulary for a new era*. Milton Park: Routledge.; Some of the recent articles on degrowth include the following: F. Sekulova, G. Kallis, B. Rodriguez-Labajos, F. Schneider. (2013). Degrowth: from theory to practice. *Journal of Cleaner Production*. 38. 1-6.; Schenider, F., Kallis, G., Martinez-Alier, J. (2010). Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. Introduction to this special issue. *Journal of Cleaner Production*. 18, 511-518; G. Kallis, C. Kerschner, J. Martinez-Alier. (2012). The economics of degrowth. *Ecological Economics*. 84, 172-180.

viii *Toward a Steady-State Economy*. (1973). Ed. Daly. H. Freeman; Daly, H. E. (1977). *Steady-State Economics*. Freeman; Daly, H. E. (1996). *Beyond Growth: The Economics of Sustainable Development*. Boston: Beacon Press; O'Neil. D. W. (2012). Measuring progress in the degrowth transition to a steady state economy. *Ecological Economics* 84, 221-231. Note, too, that there is ongoing discussion about the term "degrowth," as some prefer "postgrowth" or other terms.

ix Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., Ludwig, C. (2015). The trajectory of the Anthropocene: The great acceleration. *The Anthropocene Review*. January, 2015:

<http://anr.sagepub.com/content/early/2015/01/08/2053019614564785.abstract>

x Caradonna. (2014); Heinberg, R. (2011). *The End of Growth: Adapting to Our New Economic Reality*. New Society Publishers.

xi See Schneider, Martinez, Kallis. (2011). See also Broder. J. M. (2009, February 16). Emissions fell in 2009, showing impact of recession. *New York Times*.

xii Peter A. Victor. (2011). Growth, degrowth and climate change: A scenario analysis." *Ecological Economics*, 1-7: 2. See also K. Anderson and A. Bows-Larkin (2013). Avoiding dangerous climate change demands demands de-growth strategies from wealthier nations. (Web log comment). Retrieved from <http://kevinanderson.info/blog/avoiding-dangerous-climate-change-demands-de-growth-strategies-from-wealthier-nations/>.

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<sup>xiii</sup> The concept of sustainable development emerged at a time (late 1970s-1980s) of relative global consensus about the need for a new development path, in which catastrophic events at Minamata, Seveso, Bhopal, and Chernobyl made it impossible to overlook the social and environmental costs of the conventional modernization model. The common refrain in the United Nations was that there was need for a theory that combined the promise of material improvements with the promise of increasing social equality without destroying the environmental bases on which human life depended. See Caradonna. (2014) . (2014). *Sustainability: a history*. New York: Oxford Univ. Press; Robinson, John A. (2004). Squaring the circle? Some thoughts on the idea of sustainable development. *Ecological Economics*, 48 (4), 369-384; Borowy, I. (2014). *Defining sustainable development: The world commission on environment and development (Brundtland Commission)*. Milton Park: Routledge.; See, also, Rist, who criticizes the coupling of “development” and “sustainable.” Rist, G. (2010). Is ‘development’ a panacea? How to think beyond obsolete categories. *Canadian Journal of Development Studies/Revue d’études du développement* (30), 345-354.

<sup>xiv</sup> IUCN. (1980). *World Conservation Strategy: Living Resource Conservation for Sustainable Development*.; UNWCED. (1987). *Report of the World Commission on Environment and Development: Our Common Future*.

<sup>xv</sup> From here on, in-text page citations of the manifesto. *An Economist Manifesto*. (2015).

<sup>xvi</sup> The *Manifesto*’s assertion (16) that Native peoples hunted “most of the continent’s large mammals to extinction in the late Pleistocene, while burning and clearing forests across the continent in the process” is a thesis that is subject to intense debate. The early-natives-as-genocidal-killers-of-the-megafauna has been rejected by new studies, and questioned by others. Recent research on mastodons, using carbon dating of fossil remains, adds more evidence to the argument that the extinction of the megafauna predates human presence in North America. See Zazula, D. G., et. al. (2014). American mastodon extirpation in the arctic and subarctic predates human colonization and terminal pleistocene climate change. *PNAS* 111 (52), 18460-18465. See, more generally, Flores, J. C. (2014). Modelling Late Pleistocene megafaunal extinction and critical cases: A simple pre-predator perspective. *Ecological Modelling* (291), 218-223; Braje, T. J. and Erlandson, J. M. (2013). *Human acceleration of animal and plant extinctions: A Late Pleistocene, Holocene, and Anthropocene continuum*. Anthropocene, 2013. Moreover, the *Manifesto* suggests that native use of fire was necessarily unsustainable, which is another highly debatable point. See Pyne, S. J. (2001). *Fire: A Brief History*. University of Washington and British Museum. Many native groups managed and even created ecosystems largely through strategic use of fire, and managed to do so successfully for millennia.

<sup>xvii</sup> See for a discussion of The International Labour Organization’s report: J. Nelson (2014, May 20). Modern-day slavery generates billions: UN report. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/report-on-business/international-business/modern-day-slavery-generates-billions-according-to-new-report/article18768332/>

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- <sup>xviii</sup> Richardson, D. (2011). Involuntary migration in the early modern world. *The Cambridge World History of Slavery*, Vol. 3. Eds. Bradley, K. and Cartledge, P. Cambridge: Cambridge Univ. Press.
- <sup>xix</sup> Latour, B. (2010). An attempt at a 'Compositionist Manifesto'. *New Literary History* 41, 471-490, asks, on p.486, what it is that Modernists, with their capital 'P' conception of Progress, are actually fleeing from, given that pre-industrial societies had much less of a destructive and lasting impact on the natural world.
- <sup>xx</sup> Lovins, A. (1977). *Soft Energy Paths: Toward a Durable Peace*. Penguin; Hawken, P., Lovins, A. and Hunter, L. (1999/2000). *Natural Capitalism: Creating the Next Industrial Revolution*. New York: Little, Brown and Company.
- <sup>xxi</sup> See World Health Organization (2014). 7 million premature deaths annually linked to air pollution [press release]. Retrieved from <http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>
- <sup>xxii</sup> Ehrlich, P. R. and Holdren, J. P. (1971, March 26). Impact of population growth. *Science*, New Series, 171 (3977), 1212-1217.
- <sup>xxiii</sup> There are real concerns that geoengineering could create untold ecological problems, including severe disruptions to the hydrological cycle. See Tilmoes, Simone, et. al. (2013). The hydrological impact of geoengineering in the geoengineering model intercomparison project (GeoMIP). *Journal of Geophysical Research*. 118 (19), 11,036-11,058.; See also Charles Mann's recent and illuminating discussion of the threat of billionaires going rogue on geoengineering: C. C. Mann (2014, September). How to talk about climate change so people will listen. *The Atlantic*. Retrieved from <http://www.theatlantic.com/magazine/archive/2014/09/how-to-talk-about-climate-change-so-people-will-listen/375067/>.
- <sup>xxiv</sup> Here the authors are implicitly critiquing the Club of Rome (1972). *The Limits to Growth*. New York: Universe. See also the 30-year update to *Limits* (2004). There is an extensive literature on the Club of Rome's modeling and scenarios for the future, although the ecomodernists minimize the extensive research on ecological limits. See footnotes below for sources by Turner and Bardi.
- <sup>xxv</sup> Bush, G. H. W. (1990). *Public Papers of the Presidents of the United States: George Bush*, 1990. Best Books. 520.
- <sup>xxvi</sup> See, for instance, Turner, G. M. (2012). On the cusp of global collapse? Updated comparison of the *Limits to Growth* with historical data. *Gaia* (21), 116-124; Turner, G. M. (2008). A comparison of the *Limits to Growth* with 30 years of reality. *Global Environmental Change* (18), 397-411; Bardi, U. (2011). *The Limits to Growth Revisited*. Springer, New York; Higgs, K. (201). *Collision course: Endless growth on a finite planet*. Cambridge, MA: MIT Press.
- <sup>xxvii</sup> Heinberg (2011): 3-5, 16.; Caradonna (2014): 192; IPCC. (2011). *Renewable Energy Sources and Climate Change Mitigation*, 10.
- <sup>xxviii</sup> Roberts, P. (2008). *The End of Food*. New York; Fromartz, S. (2007). *Organic, Inc.* New York; Montgomery, D. (2007). *Dirt: The Erosion of Civilizations*. Berkeley; Keith, Lierre. (2009). *The Vegetarian Myth: Food, Justice, and Sustainability*. PM Press; Tasch, W. (2008). *Inquiries into the Nature of Slow Money: Investing as if Food, Farms, and Fertility Mattered*. Chelsea Green.

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- <sup>xxix</sup> Costa, M. F. and Ivar, J. A. (2014). The present and future of microplastic pollution in the marine environment. *Environmental Pollution*, 185, 352-364.
- <sup>xxx</sup> Brown, L. (2006). *Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble*. New York: W.W. Norton, 109. Brown cites U.S. Geological Survey data to argue that low-cost natural reserves of lead could be exhausted by 2024; tin by 2026, copper by 2031, iron ore by 2070, and bauxite by 2075.
- <sup>xxxi</sup> Ecological Footprint Analysis suggests that the world has been living in a state of global overshoot for several years now. Wackernagel, M., et. al. (2002, July 9). Tracking the ecological over-shoot of the human economy. *Proceedings of the National Academy of Sciences*, 9266-9271. See also Turner (2012), Turner (2008), and Bardi (2011).
- <sup>xxxii</sup> Diamond, J. (2005). *Collapse: How Societies Choose to Fail or Succeed*. New York: Viking Press.
- <sup>xxxiii</sup> Kurlansky, M. (1997). *Cod: a biography of the fish that changed the world*. Penguin, 2010.
- <sup>xxxiv</sup> See Caradonna, (2014), ch.4 for background. On the problems with decoupling, see Worldwatch Institute. (2015). *The state of the world report 2015: Hidden threats to sustainability*. London: Island Press, and especially ch.3, Victor, P.A. and Jackson, T. "The trouble with growth," 37-50; Wiedmann, T.O., et. al. (2013, September 3). The material footprint of nations. *PNAS*, 1-6; Smil, V. (2013). *Making the Modern World: Materials and Dematerialization*. Wiley; Murphy, D. J. and Hall, C. A. S. (2011). Energy return on investment, peak oil, and the end of economic growth in "Ecological Economics Review. Robert Constanza, Karin Limburg & Ida Kubiszewski, eds. *Ann. N.Y. Acad. Sci.* (1219), 52-72.
- <sup>xxxv</sup> IPCC (2014). *The Synthesis Report of the Fifth Assessment Report; Millennium Ecosystem Assessment*. (2005). For the HANNP, see O'Neil (2012), 225. The more basic problem is the assumption that what happened in a few Northern countries can be repeated in the rest of the world. The ecological footprint or carbon intensity in high-income countries has increased in part because a lot of extraction and production has been exported to other continents. Global trade obscures and complicates the notion of national carbon intensity and the real responsibility for consumption.
- <sup>xxxvi</sup> Jevons, W. S. (1866). *The Coal Question*. Second edition. London: Macmillan; Daly (1977); Jackson, T. (2009). *Prosperity Without Growth: Economics for a Finite Planet*. London: Earthscan.
- <sup>xxxvii</sup> See Schmelzer, M. (forthcoming, 2016). *The hegemony of growth. The making of the economic growth paradigm and the OECD, 1948-2010*. Cambridge.
- <sup>xxxviii</sup> Daly (1977); Daly (1996); O'Neil (2012).
- <sup>xxxix</sup> See Kubiszewski, I., et. al. (2013). Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics* (93), 57-68.
- <sup>xl</sup> See J. Lovelock. (2004, May 24). Nuclear power is the only green solution. *The Independent*. Retrieved from <http://www.independent.co.uk/voices/commentators/james-lovelock-nuclear-power-is-the-only-green-solution-6169341.html>.

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- xli See Caradonna (2014), 284, which cites and summarizes reports from the IPCC (2011) and the International Energy Agency. (2012). *Key World Energy Statistics*.
- xlii IPCC (2011).
- xliii Most of this material is taken from Caradonna (2014), 284.
- xliv See, for instance, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany). *Development of Renewable Energy Sources in Germany 2012*. Online at [http://www.erneuerbare-energien.de/fileadmin/Daten\\_EE/Dokumente\\_PDFs\\_/20130328\\_hgp\\_e\\_ppt\\_2012\\_fin\\_bf.pdf](http://www.erneuerbare-energien.de/fileadmin/Daten_EE/Dokumente_PDFs_/20130328_hgp_e_ppt_2012_fin_bf.pdf); see also Baake, R. (2014, December 12). Saubere Wende. *Die Zeit*. Retrieved from <http://www.zeit.de/2014/51/energiewende-klimawandel>. Also, note that, in Canada, provinces and territories wield considerable power in determining their own energy policies. The Province of Ontario has done more than most provinces or American states in moving away from fossil fuels, which it did by closing its coal-fired generating plants and prohibiting the construction of new ones. The reason that Germany, and also Denmark, are unique is in the commitment from national governments in moving away from hard energies.
- xlv Trainer, T. (2007). *Renewable Energy Cannot Sustain a Consumer Society*. Dordrecht: Springer. Along the same lines, see Zehner, O. (2012). *Green Illusions: The Dirty Secrets of Clean energy and the Future of Environmentalism*. Lincoln: Univ. of Nebraska Press.
- xlvi Sovacool, B.K., Brown, M.A. (201). Twelve metropolitan carbon footprints: a preliminary comparative global assessment. *Energy Policy* 38 (9), 4856-4869.
- xlvii See, for example, Picketty, T. 2013. *Le capital au XXIe siècle*. Éditions du Seuil; Streeck, W. 2014. *Buying time: the delayed crisis of democratic capitalism*. New York: Verson; Milanovic, B. 2005. *Worlds apart: measuring international and global inequality*. Princeton: PUP; OECD. 2014. *How was life? Global wellbeing since 1820*. Paris: OECD.
- xlviii Kristoff, N. and WuDunn, S. (2000, September 24). Two cheers for sweatshops. *New York Times*. Retrieved from <http://www.nytimes.com/2000/09/24/magazine/two-cheers-for-sweatshops.html>. ; King, F. H. (1911). *Farmers of Forty Centuries or Permanent Agriculture in China, Korea and Japan*. King.
- xlix Williams, M. (2002). *Deforesting the Earth: From Prehistory to Global Crisis*. Chicago: Univ. of Chicago Press.
- <sup>1</sup> UN. (2014). *Millennium Development Goals*, 240.
- li See the WWF report here: <https://www.worldwildlife.org/threats/deforestation>
- lii UNFAO. (2005). *Forest Resources Assessment*.
- liii In addition to the many useful and visionary sources cited in this essay, see the Degrowth Declaration from Barcelona, 2010: <http://www.barcelona.degrowth.org/Barcelona-2010-Declaration.119.0.html>.